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AN ELASTIC TUBE THEORY OF PULSE TRANSMISSION AND OSCILLATORY FLOW IN MAMMALIAN ARTERIES

BY JOHN R. WOMERSLEY

AERONAUTICAL RESEARCH LABORATORY

JANUARY 1957

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This work develops the concept of a thin walled elastic tube as a rough working model of an artery, and from a solution of the equations of motion of such a tube, filled with viscous liquid, a number of relationships are deduced that can be tested experimentally. The theory of pulse-wave transmission, and the relationships between pulse pressure, rate of flow, and radial expansion, are demonstrated as parts of a single logical structure. Some comparisons with experimental results are made and new experiments are proposed, as tests of the adequacy of the theory.

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FOREWORD

This Report is a connected account of research begun as a spare-time activity in 1952. From July 1954 - June 1955 the author was able to devote his full time to this work, supported by the Medical Research Council of Great Britain, and since then has continued and completed it at the Aeronautical Research Laboratory.

The tables which appear in the Appendix were prepared by the Computation Laboratory of Harvard University as part of Project 7060 of the Aeronautical Research Laboratory's Program, at the request of the Aero-Medical Laboratory.

The tables of M'_{10}, M'_{10}/α^2, and E'_{10} which appear in the text were computed by the Mathematics Division of the National Physical Laboratory, Teddington, England, and are reproduced by permission of the Editors of the "Journal of Physiology".

The table of the correction-function in Section X was prepared on the 1103 Computer by 1st. Lt H. Pucci, USAF, of the Computation Branch.

The author also wishes to express his thanks to the following:

Mrs. Helen Hartmann, formerly of the System Dynamics Analysis Branch, and now of the Biophysics Branch, Aero-Medical Laboratory, who programmed and accomplished on the IBM Card-programmed calculator a wide range of essential computations - Fourier Analysis, the calculation of reflection - coefficients, and a first tabulation of the quantities later recomputed by the Harvard Computation Laboratory. Mrs. Hartmann's willing and interested cooperation, and her unfailing industry and competence, are most gratefully and warmly acknowledged.

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John R. Womersley

ABSTRACT

This work develops the concept of a thin walled elastic tube as a rough working model of an artery, and from a solution of the equations of motion of such a tube, filled with viscous liquid, a number of relationships are deduced that can be tested experimentally. The theory of pulse-wave transmission, and the relationships between pulse pressure, rate of flow, and radial expansion, are demonstrated as parts of a single logical structure. Some comparisons with experimental results are made, and new experiments are proposed, as tests of the adequacy of the theory.

PUBLICATION REVIEW

This report has been received and is approved.

FOR THE COMMANDER

Nathan L. Krisberg

NATHAN L. KRISBERG
Colonel, USAF
Chief, Aeronautical Research Laboratory

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LIST OF SYMBOLS

[NOTE: An asterisk (*) over a symbol denotes the complex conjugate.]

R	Radius of tube
f	Frequency in cycles per second
n	The "circular frequency"; $2\pi f$.
t	Time
ρ_0	Density of the liquid
μ	Viscosity of the liquid
ν	Kinematic viscosity of the liquid, $= \mu/\rho_0$
α	Non-dimensional parameter $= R\sqrt{n/\nu}$
z	Distance along tube
r	Radial Coordinate
y	Non-dimensional radial coordinate $= r/R$
$A, A_1, A_2 \ldots Am \ldots$	Complex Constants defining amplitude and phase of pressure or pressure gradient, according to context.
$C_1, D_1, E_1,$	Arbitrary Constants
w	Longitudinal component of fluid velocity.
u	Radial component of fluid velocity.
$\bar{w}$	Average velocity across the tube. $\bar{w} = \int_0^1 w.\ 2y.\ dy.$
Q	Rate of flow of liquid, $Q = \pi R^2 \bar{w}$
$J_0(xi^{3/2})$	Bessel Function of order zero and complex argument.
$J_1(xi^{3/2})$	Bessel Function of order one and complex argument.
$M_0(x)$	Modulus of $J_0(xi^{3/2})$ i.e., $\lvert J_0(xi^{3/2}) \rvert$
$\theta_0(x)$	Phase of $J_0(xi^{3/2})$. i.e. $\mathrm{ph}J_0(xi^{3/2})$
$M_1(x)$	Modulus of $J_1(xi^{3/2})$.
$\theta_1(x)$	Phase of $J_1(xi^{3/2})$
M	Modulus of applied pressure-gradient
φ	Negative phase of applied pressure gradient.
h_0	$M_0(\alpha y)/M_0(\alpha)$.
δ_0	$\theta_0(\alpha) - \theta_0(\alpha y)$.
$M'_0(\alpha y)$	Modulus of $1 - \dfrac{J_0(\alpha y i^{3/2})}{J_0(\alpha i^{3/2})} = \left\lvert 1 - h_0 e^{-i\delta_0} \right\rvert$

$\varepsilon'_0\ (\alpha y)$		Phase of $\left\| -\dfrac{J_0(\alpha y i^{3/2})}{J_0(\alpha i^{3/2})} \right\| = \mathrm{ph}\{1 - h_0 e^{-i\delta_0}\}$
h_{10}	=	$2M_1(\alpha)/\alpha M_0(\alpha)$.
δ_{10}	=	$135^\circ - \theta_1 + \theta_0$.
$M'_{10}(\alpha)$	=	Modulus of $\left\| -\dfrac{2J_1(\alpha i^{3/2})}{\alpha i^{3/2} J_0(\alpha i^{3/2})} \right\| = \left\| 1 - h_{10} e^{-i\delta_{10}} \right\|$
$\varepsilon'_{10}(\alpha)$	=	Phase of $\left\| -\dfrac{2J_1(\alpha i^{3/2})}{\alpha i^{3/2} J_0(\alpha i^{3/2})} \right\| = \mathrm{ph}\{1 - h_{10} e^{-i\delta_{10}}\}$
Q_{max}		Maximum value of Q. The same as $\| Q \|$.
Q_{steady}		Poiseuille flow corresponding to maximum value of pressure gradient, if maintained constant.
h		wall-thickness of tube.
k		ratio of wall-thickness to radius of tube = h/R.
ζ		longitudinal displacement of tube wall.
ξ		radial displacement of tube wall.
E		Young's modulus of tube wall.
σ		Poisson's ratio of tube wall.
B	=	$E/(1-\sigma^2)$
c		Complex velocity of wave-propagation.
c_0		Velocity of wave-propagation for a liquid of Zero viscosity.
c_1		Velocity of wave-propagation. (Owing to the way in which c is defined, this is not the real part of c, but the reciprocal of the real part of the reciprocal of c, which is not the same.)
c_g		Group velocity.
x		$\dfrac{h}{R}\,\dfrac{B}{\rho_0 c^2}$, except in Section X, in which $x^0 = b\alpha i^{3/2} y^2$.
X		real part of c_0/c.
Y		imaginary part of c_0/c.
$F_{10}(\alpha)$		"condensed" notation for $2J_1(\alpha i^{3/2})/\ \alpha i^{3/2} J_0(\alpha i^{3/2})$.
η		complex constant appearing in flow formula.
M''_{10}		$\| 1 + \eta\, F_{10}(\alpha) \|$.
ε''_{10}		$\mathrm{ph}\{1 + \eta\, F_{10}(\alpha)\}$

E_c	complex constant replacing Young's Modulus when there is internal damping in the tube wall.
σ_c	complex constant replacing Poisson's ratio when there is internal damping in the tube wall.
w_o	steady component of longitudinal velocity. Except in Section V, in which w_0 is the value of w at $y = y_0$.
$E(l,s)$	standard correction for finite expansion of the tube, expressing the effect on the average velocity of the $(l + s)^{th}$ harmonic of interaction between the l^{th} and s^{thh} harmonics.
$E(s,o)$	As above, for the interaction between the s^{th} harmonic and the steady flow.
$E(s,-s)$	As above, expressing the effect of the s^{th} harmonic on the steady flow.
q,	average velocity over a cross-section of radius y $(y < 1)$ $q = \int_0^y w.\, 2y.dy.$
$W(l,s)$,	$W(s,o)$, $W(s,-s)$, standard corrections for the effect of the quadratic terms in the Navier-Stokes equations.
$\bar{w}_o$	average velocity across the tube of the steady stream.
b	$(2\bar{w}_0/c)^{1/2}$ i.e. b^2 is the ratio of the axial velocity of the steady stream to the complex wave-velocity.
Υ	$\left(\frac{1}{b^2} - 1\right) b\alpha i^{3/2}$
v	$x \frac{dw}{dx}$ (Section 8)
θ	$\frac{R}{h} \cdot \frac{1}{\alpha^2} \cdot \frac{4\bar{w}_o}{c}$.
β	(Section V) $\alpha\, (\mu_1/M_0)^{1/2}$.
β	(Section X) $\alpha\sqrt{1 - b^2} = \alpha\sqrt{1 - \left(\frac{2\bar{w}_o}{c}\right)^2}$
β_o	(Section X) $\alpha\sqrt{1 - \left(\frac{2\bar{w}_o}{c_o}\right)^2}$

SECTION I

INTRODUCTION

The study of the propagation of pressure waves in a viscous fluid contained in an elastic tube has a long history, going back at least as far as the work of Witzig. (1914) He derived an approximate solution of the equations of viscous fluid motion, neglecting the non-linear terms, and deduced a "frequency equation" from which he derived an approximate formula for the wave-velocity in terms of the thickness and radius of the tube, its elastic constants, the viscosity of the liquid, and the frequency. Karreman, in 1952, extended Witzig's analysis to include the flexural rigidity of the tube, and gave (without explanation of the way in which it was derived) an approximate formula for the variation of pulse velocity in a given tube with frequency and viscosity.

In 1954, Morgan and Kiely reviewed this work, and also publications by Lambossy (1951) and Branson (1945). They pointed out a number of errors, the main one being a neglect of the surface-traction exerted on the inner wall of the tube by the viscous drag, and derived a frequency equation identical (except for notation) with that derived by the author at about the same time (Womersley 1955a). They also gave two approximate formulae for the wave-velocity, characterized by them as solutions for "large" and "small" viscosity. These are more precisely described as solutions for large and small values of the important non-dimensional parameter characterizes the motion of the liquid.

$$\alpha = R\sqrt{\frac{n}{\nu}}$$

where R is the radius of the tube, n is the circular frequency (i.e. the frequency in cycles per second multiplied by 2π) and ν is the kinemetic viscosity of the liquid. In their concluding paragraph they extended their approximate formulae to take account of internal damping in the wall of the tube by replacing its elastic constants by complex quantities whose imaginary parts were proportional to the frequency.

All this earlier work was focussed on the problem of deriving approximate analytical formulae for the velocity of propagation. Morgan and Kiely also gave approximate formulae for the damping coefficient for large and small α. It is, however, the results for values of α which lie between these limits that are of the greatest interest in studying the conditions in the larger arteries. The pulse velocity is reduced by reason of the liquid being viscous, and the amount by which it is reduced depends, not on the viscosity alone, but on α.

In none of this earlier work was any attempt made to study the motion of the liquid itself.

The present work, which began with the study of the motion of the liquid as its main object, now stands as the first reasonably complete theory of flow in the larger arteries, in the sense that the consequences of assuming a simple elastic tube model have been fairly well explored. This is the first time that the theory of the velocity of wave-propagation, the pressure-flow relationships for the motion of the liquid, and the pressure-diameter relationship have all been exhibited explicitly as parts of a single logical structure. The whole of this work is original, in the sense that it was all derived independently by the author, but two of the results are not "new". The formula for oscillatory flow in a rigid tube has been published several times, from 1929 onwards. The correct form of the "frequency equation" was published by Morgan and Kiely some six or eight months before it was published by the author in 1955. The rest of the work is both original and "new", except for a trifling anticipation by Morgan and Kiely in a suggested use of complex elastic constants for a tube with internal damping, and by Morgan and Ferrante in respect of the modification of the equations when the tube has "added mass".

The main value of this work lies, it is believed, in its endeavor to show that the thin-walled elastic tube can be used as a rough working model of the artery, and that from this model can be deduced a number of relationships between observable quantities that can be tested experimentally. One broad general result is of prime importance to the physiologist who may wish to make use of it.

The relationships which are susceptible to experimental verification show only marginal differences for a wide variation in the parameters representing added mass and longitudinal constraint. The variations for changes in the Poisson's Ratio of the wall are somewhat greater, but this is not a disposable constant, since its value for arterial tissue is known to be one-half. The relationship between pressure and diameter, does, however, provide a critical test for the presence of internal damping. If variation in diameter shows a phase-lag behind variation in pressure, internal damping is present. Furthermore, if it follows the simple law used here, the phase-lag will be proportional to the frequency. It seems very probable that the best model to use, in practice, will be the limiting condition of heavy loading and stiff longitudinal constraint, with some internal damping in the wall, should it be indicated by experimental measurements of pressure and diameter variations. For such a model, all the observable relationships take their simplest form.

There is another aspect of this problem which deserves mention, in view of its importance in the study of the circulation in the smaller vessels. Blood is a suspension of particles of finite size, and the question naturally arises; how far is it reasonable to treat it as a liquid of uniform composition with constant viscosity? Verbal discussion with a number of physiologists (McDonald, Pappenheimer, Bayliss, Edholm) indicated some divergence of opinion, but there seemed to be agreement that in the major arteries the effect of the finite size of the corpuscles might well be small, though Pappenheimer mentioned some unpublished work by Coulter and himself that seemed to indicate that for oscillatory motion the viscosity of blood increased with frequency. This may well have been an erroneous impression. Recent experiments by Stacy, soon to be published, indicate that the viscosity of blood is reasonably constant in oscillatory motion in a glass tube. There is, however, a firm opinion, widely held by physiologists, that the red cells in the blood are drawn towards the centre-line of the artery. Since the viscosity of the blood varies markedly with the concentration of red cells (from 0.0156 for plasma to an upper limit of 0.04) it was suggested to the author that this study should include the condition in which there is a thin layer of liquid of lower viscosity than the rest in contact with the inner wall of the tube, i.e., in which $\mu = \mu_0$, say, from the centre of the tube to some radius r_1, and $\mu = \mu_1$ when $r > r_1$, with a discontinuous change in viscosity, μ_1 being less that μ_0. The analysis is included here (in Section V) being completed only for the limiting condition when the layer is of infinitesimal thickness. For this limiting condition the effect is very small. It seems reasonable to classify this as one of the possible refinements of the theory that must await further progress in experimental techniques.

In presenting this work, it seemed best not to attempt to maintain a rigid dichotomy between the mathematical theory and the physiological problem which has been both its incentive and its justification. To do so would destroy the essential unity of the work and would give a false impression of the way in which it was done.

Grateful acknowledgment is made of the support given to this work by the Medical Research Council of Great Britain by providing a Personal Research Grant from July 1st 1954 to June 30th 1955. To Professor K. J. Franklin, F.R.S., who welcomed the author into his department for a year, a special tribute is due, and is freely given.

It is a particular pleasure to record the friendly collaboration and criticism of Dr. D. A. McDonald, Reader in Physiology at Bart's, who not only first introduced the author to this fascinating problem, but also helped him to acquire some of the experimentalist's "feel" for the physical conditions in many small ways, hard to define, but nonetheless real. This work itself, will, it is hoped, be regarded as the successful result of an experiment in inter-disciplinary cooperation. It demonstrates that the successful application of mathematics to biological problems is not to be found in the study or the library. An essential condition for success is that the mathematician must get the "feel" of the problem by personal contact and discussion with the physiologist, and must at the same time have sufficient professional standing to maintain a critical attitude. If the mathematician is merely a junior hired "to do the mathematics" there will be no progress. If he is a Professor in another department to whose Olympian presence problems are brought, some interesting mathematics will be done, but it will lack point and substance from the physiologist's point of view. The history of past attempts at the solution of this very problem is full of such examples. It would seem that progress is likely to depend on the occurrence of happy accidents of the sort that led to the work described here.

SECTION II

OSCILLATORY FLOW OF A VISCOUS LIQUID IN A STRAIGHT, RIGID, CIRCULAR TUBE

The flow of a viscous liquid in a long, straight, circular tube under the influence of a periodic pressure gradient seems to have been first investigated by Richardson and Tyler (1929) and by Sexl (1930). If the tube is sufficiently long in relation to its diameter, there will be no radial motion of the liquid, and the velocity along the tube (w) will be independent of the distance (z) along the tube. The exact equation will then be

$$\frac{\partial w}{\partial t} = -\frac{1}{\rho}\frac{\partial p}{\partial z} + \nu\left(\frac{\partial^2 w}{\partial r^2} + \frac{1}{r}\frac{\partial w}{\partial r}\right) \qquad 2.1$$

in which $\frac{\partial p}{\partial z}$ must be independent of z, since w is so. We now assume an applied pressure gradient

$$-\frac{\partial p}{\partial z} = Ae^{int} \qquad 2.2$$

Writing $w = w_1 e^{int}$, the equation becomes

$$\frac{d^2 w_1}{dr^2} + \frac{1}{r}\frac{dw_1}{dr} - \frac{in}{\nu} w_1 = \frac{A}{\mu} \qquad 2.3$$

We now throw this into non-dimensional form by writing $y = r/R$, R being the radius of the tube. Equation 2.3 may then be written

$$\frac{d^2 w_1}{dy^2} + \frac{1}{y}\frac{dw_1}{dy} - i\alpha^2 w_1 = \frac{AR^2}{\mu} \qquad 2.4$$

in which α^2 has been written for $R^2 n/\nu$. The quantity α is a non-dimensional parameter which characterizes the form of the motion. The solution of 2.4 appropriate to the boundary conditions is

$$w_1 = \frac{AR^2}{i\mu\alpha^2}\left\{1 - \frac{J_0(\alpha y i^{3/2})}{J_0(\alpha i^{3/2})}\right\} \qquad 2.5$$

and therefore

$$w = \frac{AR^2}{i\mu\alpha^2}\left\{1 - \frac{J_0(\alpha y i^{3/2})}{J_0(\alpha i^{3/2})}\right\} e^{int} \qquad 2.6$$

or, inserting the value of α , the simpler form

$$w = \frac{A}{inp} \left\{ 1 - \frac{J_0(\alpha y i^{3/2})}{J_0(\alpha i^{3/2})} \right\} e^{int} \qquad 2.7$$

A formula essentially the same as the real part of 2.7 when A is real was published by Egami (1944) and again by Lambossy (1953). Lambossy also gave a formula for the viscous drag. He and Thurston (1952) who studied the problem at about the same time, were concerned with the effect of fluid resistance on the frequency-response of measuring instruments.

The limiting forms of this solution, for both large and small α, are well known, (Richardson and Tyler 1929). Let the pressure gradient, in real form, be $M\cos(nt-\varphi)$ For small α

$$w = \frac{MR^2}{4\mu}(1 - y^2) \cos (nt - \varphi).$$

For large α,

$$w = \frac{MR^2}{\mu\alpha^2} \left[\sin(nt-\varphi) - y^{-1/2} e^{-\alpha(1-y)/\sqrt{2}} \sin \left\{ nt-\varphi-\frac{\alpha}{\sqrt{2}} (1-y) \right\} \right]$$

Richardson and Tyler (1929) were interested in the asymptotic form of the motion at very large values of α, i.e., at sonic frequencies in air. They measured the mean square velocity at various distances from the centre of the tube, found the position of the maximum (which is near the wall in these conditions) and compared it with that predicted with the theory, finding good agreement.

If 2.7 is to be used to calculate the velocity-distribution across the tube, the conventional method of separating the Bessel Functions into their real and imaginary parts leads to very clumsy formulae. A simpler mental picture of the motion is provided by using them in modulus and phase form. Tables are available (McLachlan, 1941, Dwight, 1941, Jahnke and Emde 1938) of M_0 and θ_0, where

$$J_0(xi^{3/2}) = M_0(x)\, e^{i\delta_0(x)}$$

and therefore 2.6 may be written

$$w = \frac{AR^2}{i\mu\alpha^0} \left\{ 1 - h_0 e^{-i\delta_0} \right\} e^{int}$$

where $\delta_0 = \theta_0(\alpha) - \theta_0(\alpha y)$ and $h_0 = M_0(\alpha y)'/M_0(\alpha)$.

If we write

$$M_0' = \sqrt{1 + h_0 - 2h_0\cos\delta_0}$$

$$\tan \varepsilon_0 = \frac{h_0\sin\delta_0}{1 - h_0\cos\delta_0}$$

then

$$w = \frac{AR^2}{i\mu\alpha^2} \cdot M_0' \cdot e^{i(nt+\varepsilon_0)} \qquad 2.8$$

so that for an applied pressure gradient $M\cos(nt-\varphi)$ the corresponding velocity distribution across the tube will be given by

$$w = \frac{MR^2}{\mu} \cdot \frac{M_0'}{\alpha^2} \sin(nt - \varphi + \varepsilon_0) \qquad 2.9$$

A group of representative velocity-profiles of this type of motion is shown in Fig. 1. The values of α for the four sets of profiles (each set covers half a cycle) are 3.34 for A, 4.72 for B, 5.78 for C, and 6.67 for D. The decrease in overall velocity with increasing α, and the flattening of the profile, can be clearly seen. An experimental verification of the velocity-profile in a rigid tube has been published by Müller, who measured the velocity with a Pitot tube in a large-scale model at $\alpha = 6.43$. His curves are very similar to Fig. 1.D.

The rate of flow, Q, is given by

$$Q = 2\pi R^2 \int_0^1 wydy \qquad 2.10$$

and integration of 2.6 gives at once

$$Q = \pi R^2 \cdot \frac{A}{in\rho} \left\{1 - \frac{2J_1(\alpha i^{3/2})}{\alpha i^{3/2} J_0(\alpha i^{3/2})}\right\} e^{int} \qquad 2.11$$

so that the average velocity across the tube is

$$\bar{w} = \frac{A}{in\rho} \left\{1 - \frac{2J_1(\alpha i^{3/2})}{\alpha J_0(\alpha i^{3/2})}\right\} e^{int} \qquad 2.12$$

and for a pressure-gradient $M\cos(nt-\varphi)$ the volume of flow is

$$Q = \frac{M\pi R^4}{\mu} \cdot \frac{M_{10}'}{\alpha^2} \cdot \sin(nt - \varphi + \varepsilon_{10}') \qquad 2.13$$

in which, if $2M_1/\alpha M_0 = h_{10}$ and $\delta_{10} = 135^\circ - \theta_1(\alpha) + \theta_0(\alpha)$

$$M_{10}' = \sqrt{1 + h_{10} - 2h_{10}\cos\delta_{10}}$$

$$\text{Tan } \varepsilon_{10}' = \frac{h_{10}\sin\delta_{10}}{1 - h_{10}\sin\delta_{10}}$$

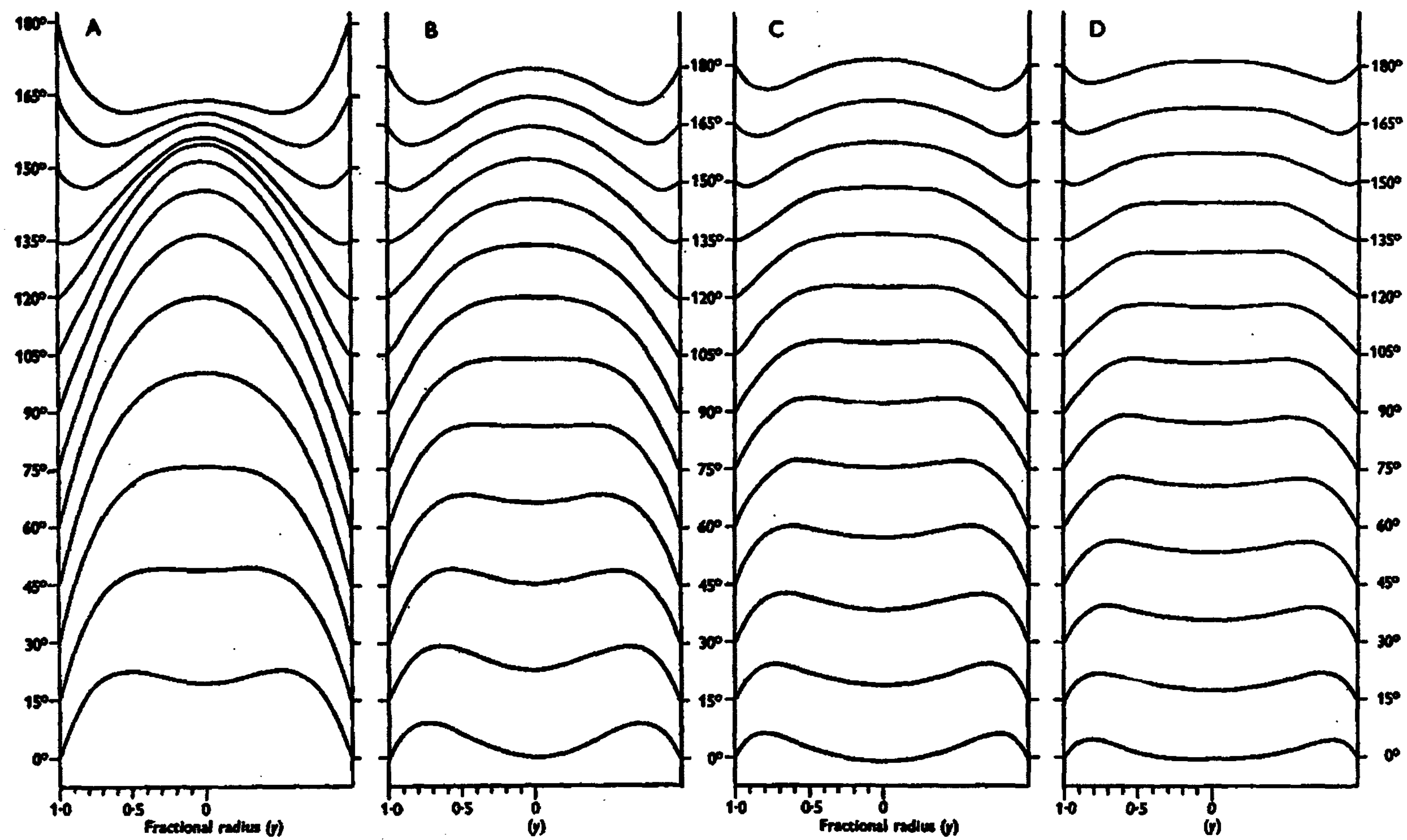


Fig.1 Velocity profiles, at intervals of 15°, of the flow arising from a sinusoidal pressure gradient in a straight rigid tube. A, α = 3.34, B, α = 4.72, C, α = 5.78. D, α = 6.67.

The quantities M'_{10}, M'_{10}/α^2 and ε'_{10} have been tabulated by the Mathematics Division of the National Physical Laboratory, for the ranges $\alpha = 0,(0.05)10$. These are reproduced here as Tables I and II. For values of α greater than 10 there are simple asymptotic expressions which can be derived from the asymptotic expansions for the Bessel Functions. These are

$$M'_{10} = 1 - \frac{2}{\alpha\sqrt{2}} + \frac{1}{\alpha^2} \tag{2.14}$$

$$\varepsilon'_{10} = \frac{2}{\alpha\sqrt{2}} + \frac{1}{\alpha^2} + \frac{19}{24\,\alpha^3\sqrt{2}} \tag{2.15}$$

The way in which the rate of flow falls off as α increases is best shown by a graph of the ratio of the maximum flow during the cycle to the Poiseuille flow which would result from the same pressure-gradient, if constant. We have

$$\frac{Q_{max}}{Q_{steady}} = \frac{8M'_{10}}{\alpha^2} \tag{2.16}$$

and this ratio is plotted, against α in Fig. 2, together with a graph of the phase-lag, $90^{\circ} - \varepsilon'_{10}$.

If, instead of Qmax/Qsteady, its reciprocal, $\alpha^2/8M'_{10}$ is plotted against α^2, this may be regarded (by electrical analogy) as a plot of the modulus of the fluid impedance against frequency, since α^2 is proportional to the frequency. Such a plot is shown in Fig. 3, in which the upper curve shows the variation of $\alpha^2/8M'_{10}$ with α^2. The lower curve will be described in Section VI.

Pressing the analogy further, one may take the quantity $\frac{i\alpha^2}{8M'_{10}} e^{i\varepsilon'_{10}}$ and separate it into its real and imaginary parts,

$$\frac{\alpha^2}{8M'_{10}} \sin \varepsilon'_{10} + i\frac{\alpha^2}{8M'_{10}} \cos \varepsilon'_{10} \tag{2.17}$$

The real part of 2.17 may be regarded as a non-dimensional fluid resistance, and its imaginary part as the fluid reactance, so that $\cos\varepsilon'_{10}/8M'_{10}$ may be regarded as a non-dimensional fluid inductance. Graphs of fluid resistance and inductance are given in Figs. 4 and 5. Here again the upper curves are those for the rigid tube. The fluid resistance rises almost linearly with frequency. The change in inductance with frequency is small. It is substantially constant for large values of α.

TABLE I

α	M'_{10}	α	M'_{10}	α	M'_{10}	α	M'_{10}	α	M'_{10}
.00	0	2.00	.4125	4.00	.7062	6.00	.7909	8.00	.8384
.05	.0003	2.05	.4264	4.05	.7092	6.05	.7924	8.05	.8393
.10	.0012	2.10	.4400	4.10	.7122	6.10	.7939	8.10	.8402
.15	.0028	2.15	.4532	4.15	.7151	6.15	.7953	8.15	.8411
.20	.0050	2.20	.4660	4.20	.7179	6.20	.7968	8.20	.8420
.25	.0078	2.25	.4784	4.25	.7206	6.25	.7982	8.25	.8429
.30	.0112	2.30	.4905	4.30	.7233	6.30	.7997	8.30	.8437
.35	.0153	2.35	.5021	4.35	.7259	6.35	.8010	8.35	.8446
.40	.0200	2.40	.5133	4.40	.7285	6.40	.8024	8.40	.8454
.45	.0253	2.45	.5241	4.45	.7310	6.45	.8038	8.45	.8463
.50	.0312	2.50	.5344	4.50	.7334	6.50	.8051	8.50	.8471
.55	.0378	2.55	.5444	4.55	.7358	6.55	.8065	8.55	.8479
.60	.0449	2.60	.5539	4.60	.7382	6.60	.8078	8.60	.8487
.65	.0527	2.65	.5631	4.65	.7405	6.65	.8090	8.65	.8495
.70	.0610	2.70	.5718	4.70	.7428	6.70	.8103	8.70	.8503
.75	.0700	2.75	.5802	4.75	.7450	6.75	.8116	8.75	.8511
.80	.0795	2.80	.5882	4.80	.7472	6.80	.8128	8.80	.8519
.85	.0896	2.85	.5959	4.85	.7493	6.85	.8140	8.85	.8526
.90	.1003	2.90	.6032	4.90	.7515	6.90	.8152	8.90	.8534
.95	.1115	2.95	.6102	4.95	.7536	6.95	.8164	8.95	.8541
1.00	.1232	3.00	.6169	5.00	.7556	7.00	.8176	9.00	.8549
1.05	.1354	3.05	.6233	5.05	.7576	7.05	.8188	9.05	.8556
1.10	.1481	3.10	.6294	5.10	.7596	7.10	.8199	9.10	.8564
1.15	.1612	3.15	.6353	5.15	.7616	7.15	.8211	9.15	.8571
1.20	.1747	3.20	.6409	5.20	.7635	7.20	.8222	9.20	.8578
1.25	.1886	3.25	.6463	5.25	.7654	7.25	.8233	9.25	.8585
1.30	.2029	3.30	.6514	5.30	.7673	7.30	.8244	9.30	.8592
1.35	.2174	3.35	.6563	5.35	.7691	7.35	.8255	9.35	.8599
1.40	.2322	3.40	.6611	5.40	.7709	7.40	.8265	9.40	.8606
1.45	.2472	3.45	.6656	5.45	.7727	7.45	.8276	9.45	.8613
1.50	.2624	3.50	.6700	5.50	.7745	7.50	.8286	9.50	.8620
1.55	.2776	3.55	.6742	5.55	.7762	7.55	.8297	9.55	.8626
1.60	.2930	3.60	.6783	5.60	.7780	7.60	.8307	9.60	.8633
1.65	.3083	3.65	.6822	5.65	.7796	7.65	.8317	9.65	.8639
1.70	.3237	3.70	.6860	5.70	.7813	7.70	.8327	9.70	.8646
1.75	.3389	3.75	.6896	5.75	.7830	7.75	.8336	9.75	.8652
1.80	.3540	3.80	.6931	5.80	.7846	7.80	.8346	9.80	.8659
1.85	.3690	3.85	.6965	5.85	.7862	7.85	.8356	9.85	.8665
1.90	.3837	3.90	.6999	5.90	.7878	7.90	.8365	9.90	.8671
1.95	.3982	3.95	.7031	5.95	.7893	7.95	.8375	9.95	.8677
2.00	.4125	4.00	.7062	6.00	.7909	8.00	.8384	10.00	.8684

Linear interpolation produces an error not exceeding 1 unit in the last figure.

Tables 2 and 3 (Combined).

TABLE 3. M'_{10}/α^2 and ϵ_{10} tabulated for values of α from 0 to 10.

α	M'_{10}/α^2	ϵ_{10}	α	M'_{10}/α^2	ϵ_{10}	α	M'_{10}/α^2	ϵ_{10}	α	M'_{10}/α^2	ϵ_{10}
0·00	0·1250	90·00	2·50	0·0855	44·93	5·00	0·0302	18·65	7·50	0·0147	11·87
·05	·1250	89·96	2·55	·0837	43·88	5·05	·0297	18·43	7·55	·0146	11·78
·10	·1250	89·90	2·60	·0819	42·86	5·10	·0292	18·23	7·60	·0144	11·70
·15	·1250	89·79	2·65	·0802	41·86	5·15	·0287	18·02	7·65	·0142	11·61
·20	·1250	89·62	2·70	·0784	40·90	5·20	·0282	17·83	7·70	·0140	11·53
0·25	0·1250	89·40	2·75	0·0767	39·96	5·25	0·0278	17·63	7·75	0·0139	11·45
·30	·1250	89·14	2·80	·0750	39·05	5·30	·0273	17·44	7·80	·0137	11·37
·35	·1250	88·83	2·85	·0734	38·17	5·35	·0269	17·26	7·85	·0136	11·29
·40	·1250	88·47	2·90	·0717	37·32	5·40	·0264	17·08	7·90	·0134	11·21
·45	·1249	88·07	2·95	·0701	36·50	5·45	·0260	16·90	7·95	·0133	11·14
0·50	0·1249	87·61	3·00	0·0685	35·70	5·50	0·0256	16·73	8·00	0·0131	11·06
·55	·1248	87·11	3·05	·0670	34·93	5·55	·0252	16·56	8·05	·0130	10·98
·60	·1248	86·57	3·10	·0655	34·18	5·60	·0248	16·39	8·10	·0128	10·91
·65	·1247	85·97	3·15	·0640	33·46	5·65	·0244	16·23	8·15	·0127	10·84
·70	·1246	85·33	3·20	·0626	32·77	5·70	·0240	16·07	8·20	·0125	10·77
0·75	0·1244	84·65	3·25	0·0612	32·09	5·75	0·0237	15·91	8·25	0·0124	10·70
·80	·1243	83·91	3·30	·0598	31·45	5·80	·0233	15·76	8·30	·0122	10·63
·85	·1240	83·14	3·35	·0585	30·82	5·85	·0230	15·61	8·35	·0121	10·56
·90	·1238	82·32	3·40	·0572	30·22	5·90	·0226	15·46	8·40	·0120	10·49
·95	·1235	81·45	3·45	·0559	29·64	5·95	·0223	15·32	8·45	·0119	10·42
1·00	0·1232	80·55	3·50	0·0547	29·08	6·00	0·0220	15·18	8·50	0·0117	10·36
1·05	·1228	79·60	3·55	·0535	28·53	6·05	·0216	15·04	8·55	·0116	10·29
1·10	·1224	78·61	3·60	·0523	28·01	6·10	·0213	14·90	8·60	·0115	10·22
1·15	·1219	77·59	3·65	·0512	27·51	6·15	·0210	14·77	8·65	·0114	10·16
1·20	·1213	76·53	3·70	·0501	27·02	6·20	·0207	14·63	8·70	·0112	10·10
1·25	0·1207	75·44	3·75	0·0490	26·55	6·25	0·0204	14·50	8·75	0·0111	10·04
1·30	·1200	74·31	3·80	·0480	26·10	6·30	·0201	14·38	8·80	·0110	9·97
1·35	·1193	73·16	3·85	·0470	25·66	6·35	·0199	14·25	8·85	·0109	9·91
1·40	·1185	71·98	3·90	·0460	25·24	6·40	·0196	14·13	8·90	·0108	9·85
1·45	·1176	70·77	3·95	·0451	24·83	6·45	·0193	14·01	8·95	·0107	9·79
1·50	0·1166	69·54	4·00	0·0441	24·43	6·50	0·0191	13·89	9·00	0·0106	9·73
1·55	·1156	68·30	4·05	·0432	24·05	6·55	·0188	13·77	9·05	·0104	9·68
1·60	·1144	67·03	4·10	·0424	23·68	6·60	·0185	13·66	9·10	·0103	9·62
1·65	·1133	65·76	4·15	·0415	23·32	6·65	·0183	13·54	9·15	·0102	9·56
1·70	·1120	64·47	4·20	·0407	22·98	6·70	·0181	13·43	9·20	·0101	9·51
1·75	0·1107	63·18	4·25	0·0399	22·64	6·75	0·0178	13·32	9·25	0·0100	9·45
1·80	·1093	61·89	4·30	·0391	22·32	6·80	·0176	13·21	9·30	·0099	9·40
1·85	·1078	60·59	4·35	·0384	22·00	6·85	·0173	13·11	9·35	·0098	9·34
1·90	·1063	59·30	4·40	·0376	21·70	6·90	·0171	13·00	9·40	·0097	9·29
1·95	·1047	58·02	4·45	·0369	21·40	6·95	·0169	12·90	9·45	·0096	9·24
2·00	0·1031	56·74	4·50	0·0362	21·11	7·00	0·0167	12·80	9·50	0·0096	9·18
2·05	·1015	55·47	4·55	·0355	20·84	7·05	·0165	12·70	9·55	·0095	9·13
2·10	·0998	54·22	4·60	·0349	20·56	7·10	·0163	12·60	9·60	·0094	9·08
2·15	·0980	52·98	4·65	·0342	20·30	7·15	·0161	12·50	9·65	·0093	9·03
2·20	·0963	51·77	4·70	·0336	20·05	7·20	·0159	12·41	9·70	·0092	8·98
2·25	0·0945	50·57	4·75	0·0330	19·80	7·25	0·0157	12·31	9·75	0·0091	8·93
2·30	·0927	49·39	4·80	·0324	19·55	7·30	·0155	12·22	9·80	·0090	8·88
2·35	·0909	48·24	4·85	·0319	19·32	7·35	·0153	12·13	9·85	·0089	8·84
2·40	·0891	47·11	4·90	·0313	19·09	7·40	·0151	12·04	9·90	·0088	8·79
2·45	·0873	46·01	4·95	·0308	18·86	7·45	·0149	11·95	9·95	·0088	8·74
2·50	0·0855	44·93	5·00	0·0302	18·65	7·50	0·0147	11·87	10·00	0·0087	8·69

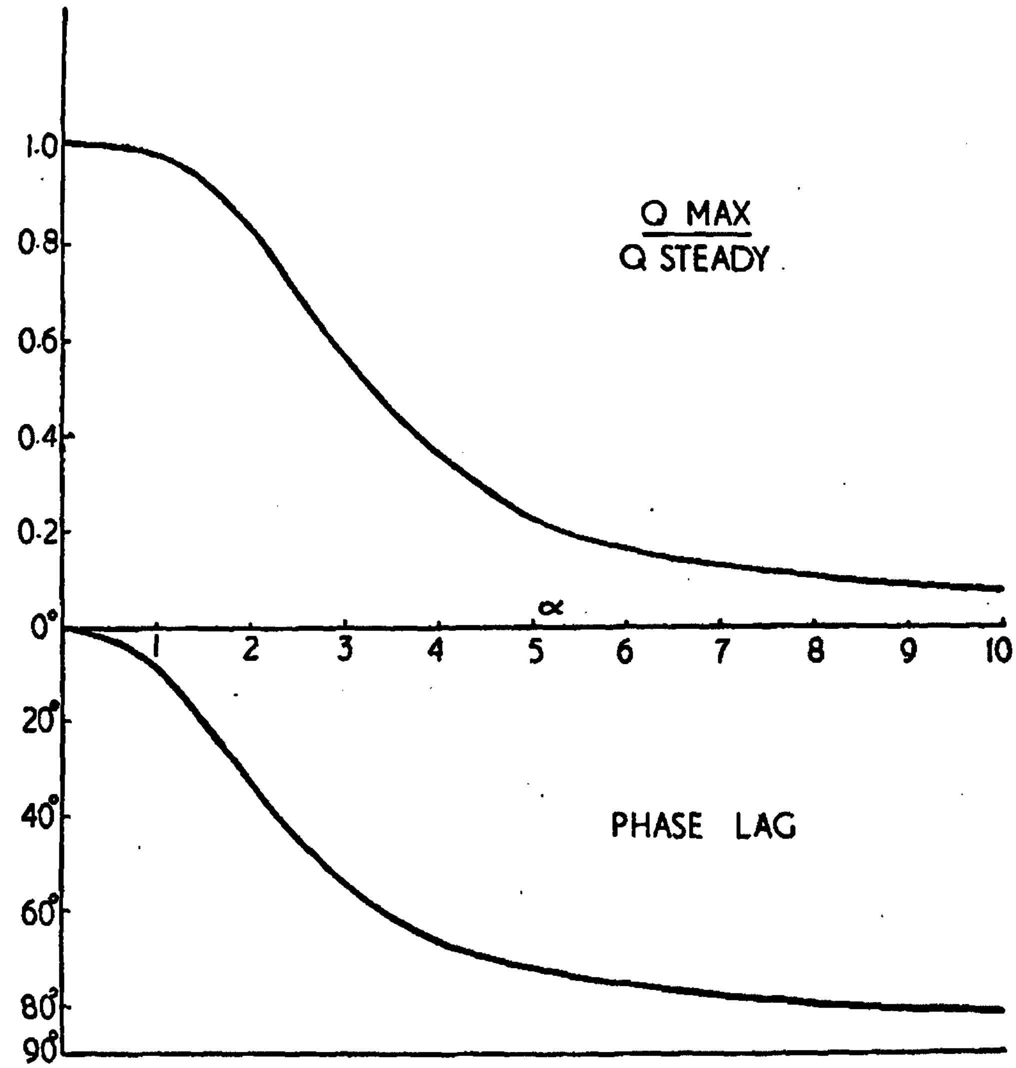
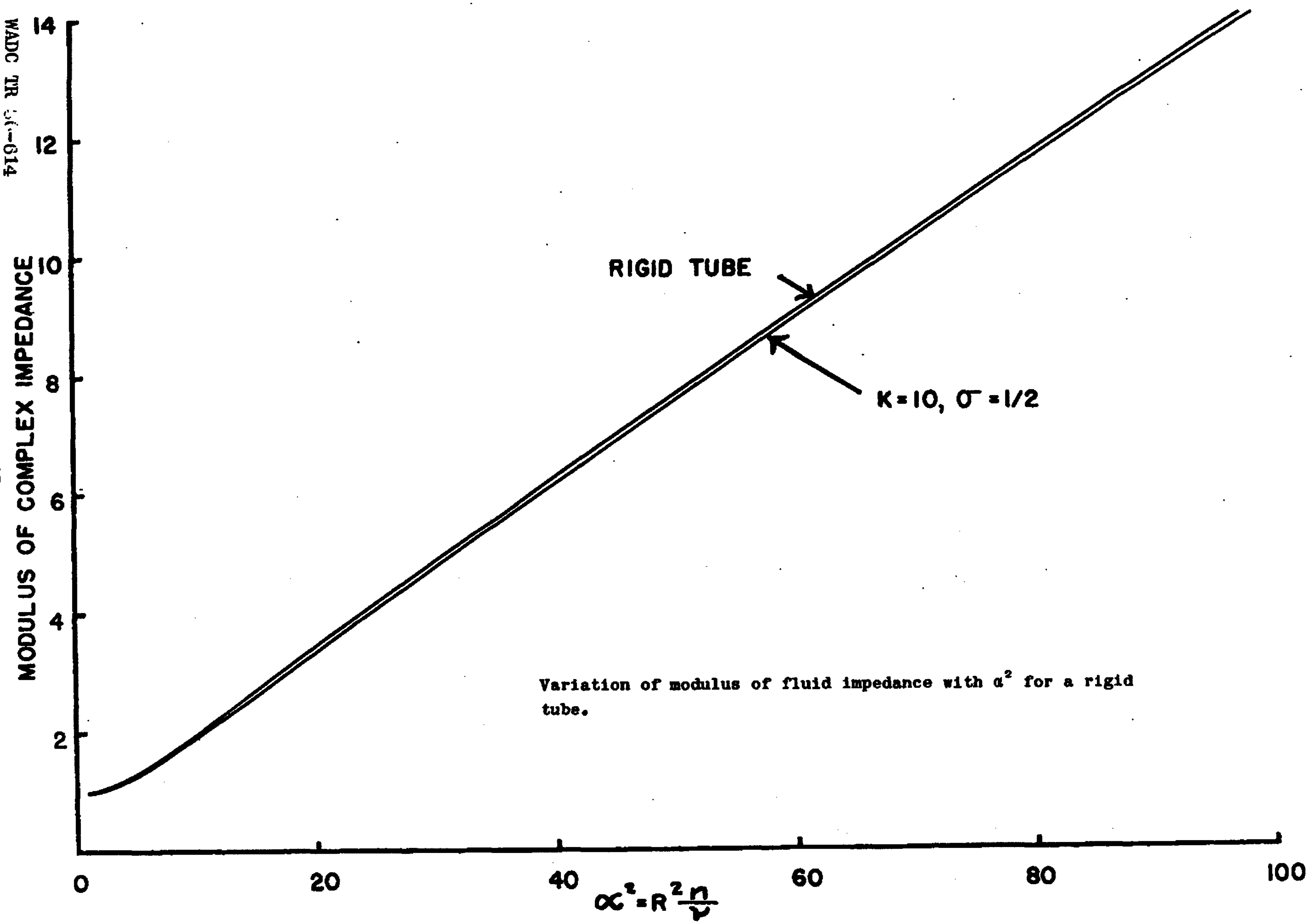


Fig. 2

Q_{max}/ Q_{steady} and Phase-lag (90^{0} - ε_{io}') against α. for a rigid tube.



Variation of modulus of fluid impedance with α^2 for a rigid tube.

Fig. 3

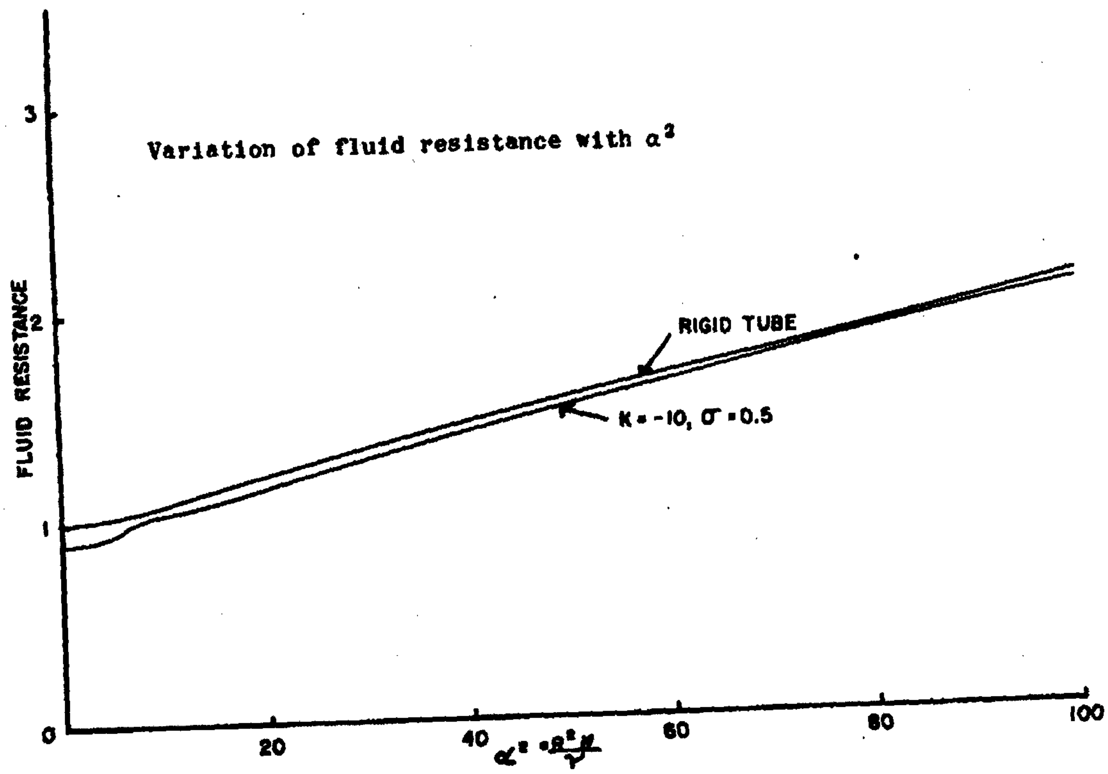

Variation of fluid resistance with α^2
RIGID TUBE
K = -10, σ = 0.5
FLUID RESISTANCE
3
2
1
0
20
40
60
80
100
$\alpha^2 = \frac{a^2 n}{\nu}$

FIG. 4

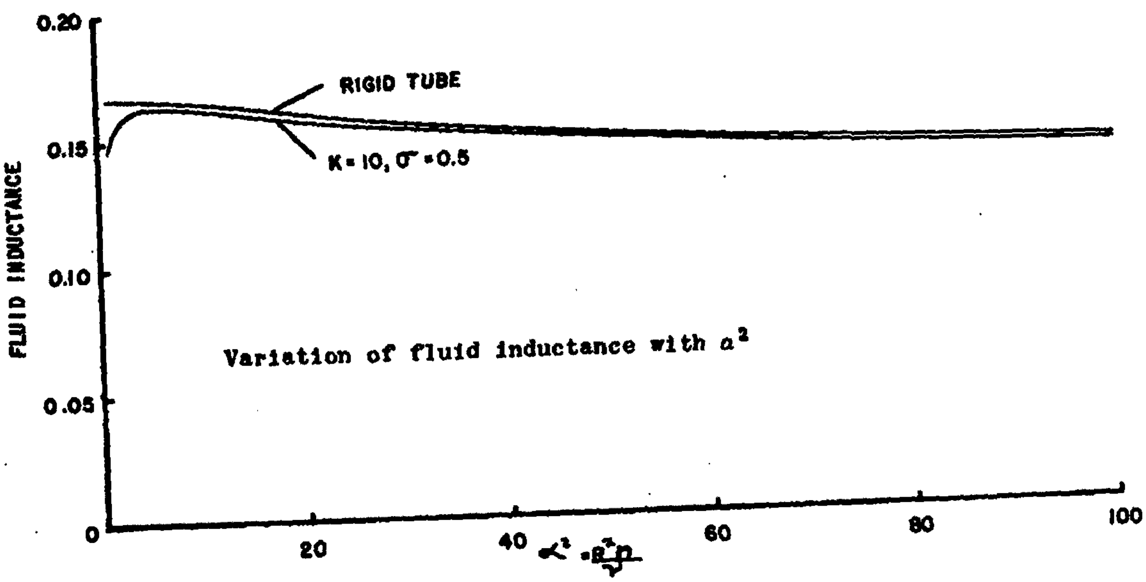

RIGID TUBE
K = 10, σ = 0.5
Variation of fluid inductance with α^2
FLUID INDUCTANCE
0.20
0.15
0.10
0.05
0
20
40
60
80
100
$\alpha^2 = \frac{a^2 n}{\nu}$

FIG. 5

The wide variation in maximum rate of flow with α raises the question of how much α is likely to vary in different animals. At corresponding points it is very much the same in man, cat, dog, and rabbit. This indicates a rough kinematical similarity in flow in all these, and shows that the fluctuating flow in the great arteries in these animals and man has the same form, and differs only in scale.

Application of 2.13 to the computation of flow from an observed pressure gradient is best made in an alternative form. Let the Fourier Series representing the pressure gradient be

$$A_0 + \sum_m (A_m \cos mnt + B_m \sin mnt) \qquad 2.18$$

and let this, when written in modulus and phase form, be

$$A_0 + \Sigma_m M_m \cos(mnt - \varphi_m) \qquad 2.19$$

Then the contribution to the flow made by the mth harmonic will be (from 2.13)

$$Q_m = \pi R^2 \cdot \frac{M_m}{mn\rho} M'_{10}(\alpha_m) \sin\left\{mnt - \varphi_m + \varepsilon'_{10}(\alpha_m)\right\} \qquad 2.20$$

in which α_m will be the value of α appropriate to the mth harmonic, i.e., $\alpha = \alpha_1\sqrt{m}$ where α_1 is that value appropriate to the pulse frequency. If 2.20 is expanded it may be written

$$Q_m = \frac{\pi R^2}{mn\rho} \sin nt \left[A_m\left\{M'_{10}(\alpha_m)\cos \varepsilon'_{10}(\alpha_m)\right\} + B_m\left\{M'_{10}(\alpha_m)\sin \varepsilon'_{10}(\alpha_m)\right\}\right]$$
$$+ \frac{\pi R^2}{mn\rho} \cos nt \left[A_m\left\{M'_{10}(\alpha_m) \sin \varepsilon'_{10}(\alpha_m)\right\} - B_m\left\{M'_{10}(\alpha_m)\cos \varepsilon'_{10}(\alpha_m)\right\}\right]$$

Since, however, $M'_{10} \cos \varepsilon'_{10}$ and $M'_{10} \sin \varepsilon'_{10}$ are the real and imaginary parts of

$$1 - \frac{2J_1(\alpha_m i^{3/2})}{\alpha_m i^{3/2} J_0(\alpha_m i^{3/2})}$$

the practical calculation of flow from the pressure gradient is best done from a table of the real and imaginary parts of this function. Write

$$C_m = \left\{1 - \frac{2J_1(\alpha_m i^{3/2})}{\alpha_m i^{3/2} J_0(\alpha_m i^{3/2})}\right\}_{re} = 1 - \frac{2M_1}{\alpha M_0} \cos \delta_{10}$$

$$D_m = \left\{1 - \frac{2J_1(\alpha_m i^{3/2})}{\alpha_m i^{3/2} J_0(\alpha_m i^{3/2})}\right\}_{im} = \frac{2M_1}{\alpha M_0} \sin \delta_{10}$$

Then

$$Q_m = \frac{\pi R^2}{mn\rho}(A_m C_m + B_m D_m)\sin + \frac{\pi R^2}{mn\rho}(A_m D_m - B_m C_m)\cos mnt \qquad 2.21$$

The quantities C_m and D_m are given in Table 4. at intervals of 0.05 in α, from $\alpha = 0$ to $\alpha = 10$.

McDonald (1955) made measurements of pressure gradient and flow in the femoral artery of the dog, the rate of flow being obtained from the average velocity across the tube, which was measured by following the motion of a gas-bubble in the artery by means of high speed cinematography. A comparison of the observed rate of flow with that calculated from 2.20 is shown in Fig. 6. The pulse-frequency was 3 cycles per second. The assumed values for the other quantities were:

Radius of artery	0.15 cm
Viscosity of blood	0.04 poise
Density of blood	1.05 gm./(cm)^3

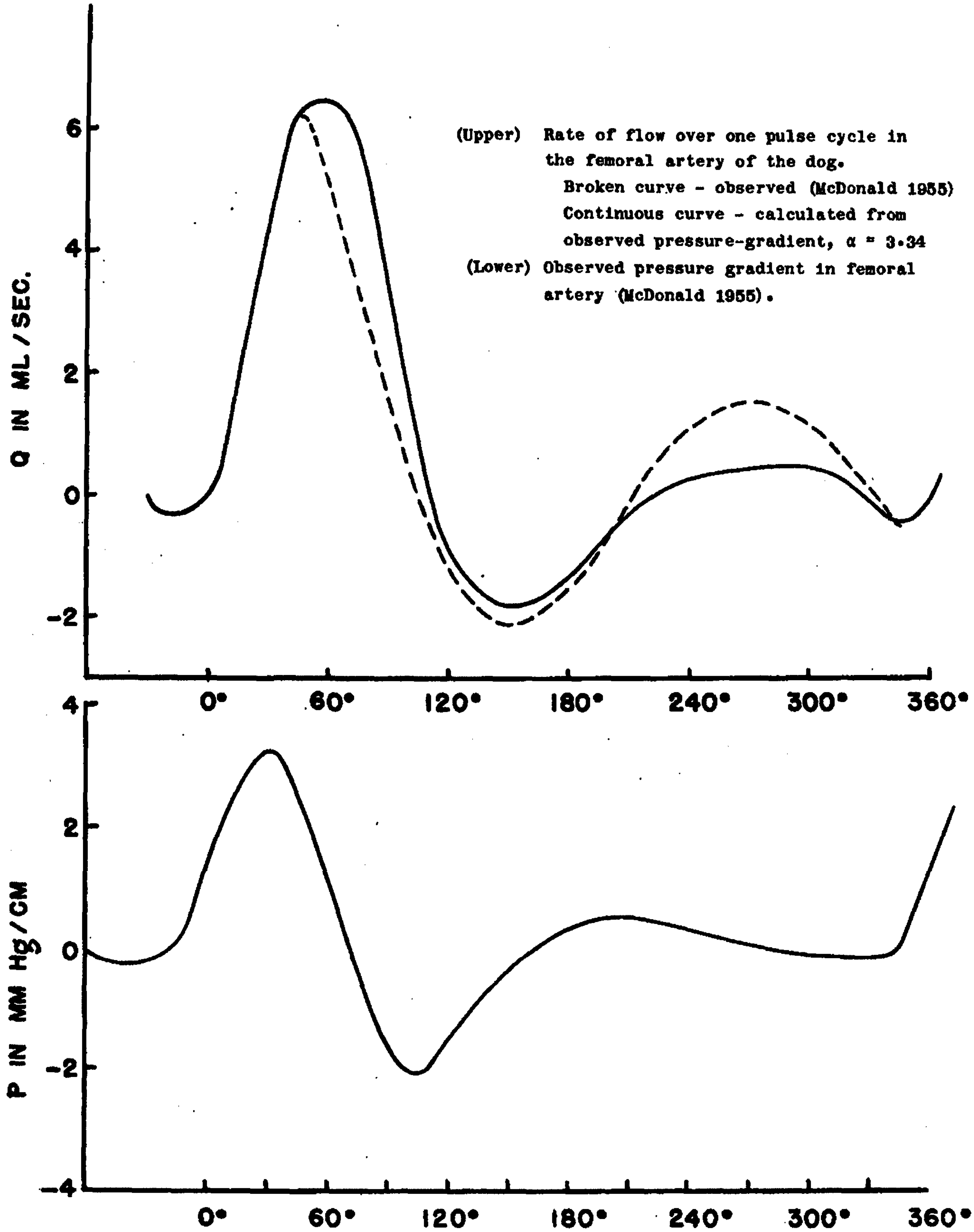
These gave a value of α of 3.34 for the fundamental. The agreement between theory and experiment is good, when one recalls the drastic nature of the assumption that the artery is a rigid tube, and that the formula contains no disposable constants.

If no assumptions are made about the viscosity of the blood, or the radius of the artery, the average velocity across the artery can be calculated from 2.20, if the density, the frequency, and the value of α, are known. Treating α, therefore, as a disposable constant, a better fit to the observations can be obtained, as is shown in Fig. 7, which gives the comparison between observed and calculated rates of flow for $\alpha = 2.7$. This value of α was chosen by making the two curves fit exactly at the point of reversal of flow - a point which is particularly well-determined by the method.

In the same investigation McDonald also made use of a suggestion made by the

TABLE 4

α	1−F₁₀(α) REAL	1−F₁₀(α) IMAGINARY	α	1−F₁₀(α) REAL	1−F₁₀(α) IMAGINARY	α	1−F₁₀(α) REAL	1−F₁₀(α) IMAGINARY	α	1−F₁₀(α) REAL	1−F₁₀(α) IMAGINARY	α	1−F₁₀(α) REAL	1−F₁₀(α) IMAGINARY
0.00	0.0000	0.0000	2.00	0.2262	0.3449	4.00	0.6430	0.2921	6.00	0.7633	0.2070	8.00	0.8228	0.1608
0.05	0.0000	0.0003	2.05	0.2417	0.3513	4.05	0.6477	0.2890	6.05	0.7652	0.2056	8.05	0.8239	0.1599
0.10	0.0000	0.0012	2.10	0.2572	0.3569	4.10	0.6522	0.2860	6.10	0.7672	0.2041	8.10	0.8250	0.1590
0.15	0.0000	0.0028	2.15	0.2728	0.3618	4.15	0.6566	0.2831	6.15	0.7691	0.2027	8.15	0.8261	0.1582
0.20	0.0000	0.0050	2.20	0.2884	0.3660	4.20	0.6609	0.2802	6.20	0.7710	0.2013	8.20	0.8272	0.1573
0.25	0.0001	0.0078	2.25	0.3039	0.3695	4.25	0.6651	0.2774	6.25	0.7728	0.1999	8.25	0.8282	0.1564
0.30	0.0002	0.0112	2.30	0.3192	0.3723	4.30	0.6691	0.2747	6.30	0.7746	0.1985	8.30	0.8292	0.1556
0.35	0.0003	0.0153	2.35	0.3344	0.3745	4.35	0.6730	0.2720	6.35	0.7764	0.1972	8.35	0.8303	0.1547
0.40	0.0005	0.0200	2.40	0.3494	0.3761	4.40	0.6769	0.2693	6.40	0.7782	0.1959	8.40	0.8313	0.1539
0.45	0.0009	0.0253	2.45	0.3640	0.3770	4.45	0.6806	0.2667	6.45	0.7799	0.1945	8.45	0.8323	0.1531
0.50	0.0013	0.0312	2.50	0.3784	0.3774	4.50	0.6842	0.2642	6.50	0.7816	0.1932	8.50	0.8333	0.1523
0.55	0.0019	0.0377	2.55	0.3924	0.3773	4.55	0.6877	0.2617	6.55	0.7833	0.1920	8.55	0.8343	0.1515
0.60	0.0027	0.0448	2.60	0.4061	0.3768	4.60	0.6911	0.2593	6.60	0.7849	0.1907	8.60	0.8352	0.1507
0.65	0.0037	0.0525	2.65	0.4193	0.3758	4.65	0.6945	0.2569	6.65	0.7866	0.1894	8.65	0.8362	0.1499
0.70	0.0050	0.0608	2.70	0.4322	0.3744	4.70	0.6978	0.2546	6.70	0.7882	0.1882	8.70	0.8371	0.1491
0.75	0.0065	0.0697	2.75	0.4447	0.3726	4.75	0.7010	0.2523	6.75	0.7897	0.1870	8.75	0.8381	0.1483
0.80	0.0084	0.0791	2.80	0.4568	0.3706	4.80	0.7041	0.2501	6.80	0.7913	0.1858	8.80	0.8390	0.1475
0.85	0.0107	0.0890	2.85	0.4684	0.3685	4.85	0.7072	0.2479	6.85	0.7928	0.1846	8.85	0.8399	0.1468
0.90	0.0134	0.0994	2.90	0.4797	0.3657	4.90	0.7101	0.2458	6.90	0.7943	0.1834	8.90	0.8408	0.1460
0.95	0.0166	0.1102	2.95	0.4905	0.3629	4.95	0.7131	0.2437	6.95	0.7958	0.1823	8.95	0.8417	0.1453
1.00	0.0202	0.1215	3.00	0.5010	0.3600	5.00	0.7159	0.2416	7.00	0.7973	0.1811	9.00	0.8426	0.1446
1.05	0.0244	0.1332	3.05	0.5110	0.3569	5.05	0.7188	0.2396	7.05	0.7988	0.1800	9.05	0.8435	0.1438
1.10	0.0292	0.1452	3.10	0.5207	0.3536	5.10	0.7215	0.2376	7.10	0.8002	0.1789	9.10	0.8443	0.1431
1.15	0.0346	0.1574	3.15	0.5300	0.3503	5.15	0.7242	0.2356	7.15	0.8016	0.1778	9.15	0.8452	0.1424
1.20	0.0407	0.1699	3.20	0.5389	0.3468	5.20	0.7269	0.2337	7.20	0.8030	0.1767	9.20	0.8460	0.1417
1.25	0.0474	0.1826	3.25	0.5475	0.3434	5.25	0.7294	0.2318	7.25	0.8044	0.1756	9.25	0.8469	0.1410
1.30	0.0549	0.1953	3.30	0.5557	0.3398	5.30	0.7320	0.2300	7.30	0.8057	0.1745	9.30	0.8477	0.1403
1.35	0.0630	0.2081	3.35	0.5636	0.3363	5.35	0.7345	0.2282	7.35	0.8070	0.1735	9.35	0.8485	0.1396
1.40	0.0718	0.2208	3.40	0.5712	0.3327	5.40	0.7369	0.2264	7.40	0.8083	0.1724	9.40	0.8493	0.1389
1.45	0.0814	0.2334	3.45	0.5785	0.3292	5.45	0.7394	0.2246	7.45	0.8096	0.1714	9.45	0.8501	0.1382
1.50	0.0917	0.2458	3.50	0.5856	0.3256	5.50	0.7417	0.2229	7.50	0.8109	0.1704	9.50	0.8509	0.1376
1.55	0.1027	0.2580	3.55	0.5923	0.3221	5.55	0.7441	0.2212	7.55	0.8122	0.1694	9.55	0.8517	0.1369
1.60	0.1143	0.2698	3.60	0.5988	0.3185	5.60	0.7463	0.2195	7.60	0.8134	0.1684	9.60	0.8525	0.1363
1.65	0.1266	0.2811	3.65	0.6051	0.3151	5.65	0.7486	0.2179	7.65	0.8147	0.1674	9.65	0.8532	0.1356
1.70	0.1395	0.2921	3.70	0.6111	0.3116	5.70	0.7508	0.2163	7.70	0.8159	0.1664	9.70	0.8540	0.1350
1.75	0.1529	0.3025	3.75	0.6169	0.3082	5.75	0.7530	0.2147	7.75	0.8171	0.1655	9.75	0.8547	0.1343
1.80	0.1668	0.3123	3.80	0.6225	0.3049	5.80	0.7551	0.2131	7.80	0.8182	0.1645	9.80	0.8555	0.1337
1.85	0.1812	0.3215	3.85	0.6279	0.3016	5.85	0.7572	0.2115	7.85	0.8194	0.1636	9.85	0.8562	0.1331
1.90	0.1959	0.3300	3.90	0.6331	0.2984	5.90	0.7593	0.2100	7.90	0.8206	0.1627	9.90	0.8569	0.1325
1.95	0.2109	0.3378	3.95	0.6381	0.2952	5.95	0.7613	0.2085	7.95	0.8217	0.1617	9.95	0.8577	0.1319
2.00	0.2262	0.3449	4.00	0.6430	0.2921	6.00	0.7633	0.2070	8.00	0.8228	0.1608	10.00	0.8584	0.1312



(Upper) Rate of flow over one pulse cycle in the femoral artery of the dog.
Broken curve - observed (McDonald 1955)
Continuous curve - calculated from observed pressure-gradient, α = 3.34
(Lower) Observed pressure gradient in femoral artery (McDonald 1955).
Q IN ML / SEC.
6
4
2
0
-2
0°
60°
120°
180°
240°
300°
360°
P IN MM Hg/CM
4
2
0
-2
-4
0°
60°
120°
180°
240°
300°
360°

Fig. 6

author, (Womersley 1955b) that the rate of flow might be calculated from the time-derivative of the pressure. It is well-known that for a wave-form travelling without distortion at a velocity c,

$$\boxed{-\frac{\partial p}{\partial z} = \frac{1}{c}\frac{\partial p}{\partial t}}$$

and therefore if c is known, the Fourier Series for the time-derivative can be used to calculate the rate of flow. The experimental technique is simpler than that required for the measurement of pressure-gradient, since a single pressure-measuring device may be used, fitted with a time-differentiating input to the amplifier. This method measures the amplitudes of the oscillatory terms only, and does not enable the steady flow to be checked against the constant term in the pressure gradient. If there is any perceptible reflection of the pulse wave, 2.21 is no longer true, and the consequences of this are considered in Section VII.

It is shown later (in Section VI) that this simple rigid tube formula applies to an elastic tube under limiting conditions of stiff constraint, and the good agreement between the rigid tube formula and McDonald's results is admissible as evidence in considering whether such conditions of constraint apply to the artery.

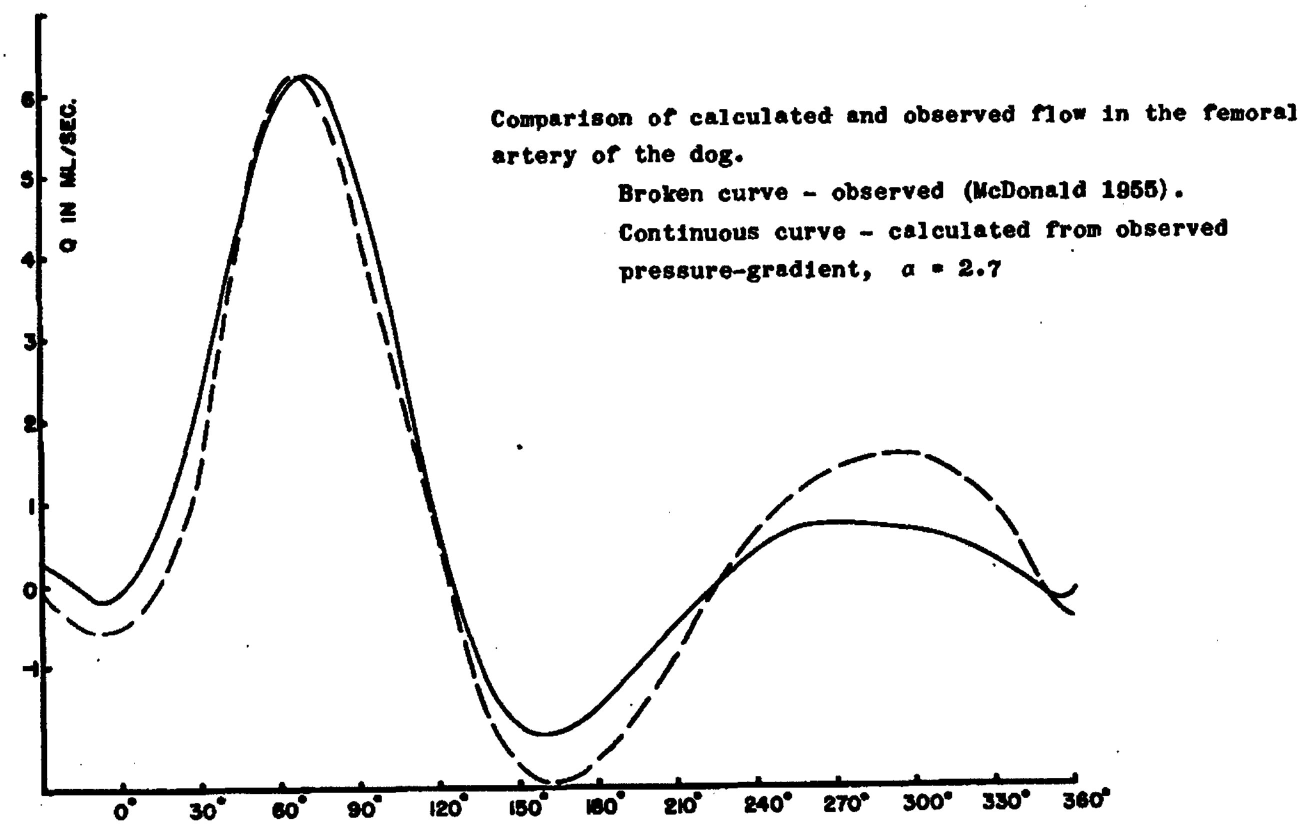


FIG. 7

SECTION III

THE EQUATIONS OF MOTION OF THE FREELY-MOVING ELASTIC TUBE AND THE DERIVATION OF THE PULSE-VELOCITY

In Lamb's paper (1898) "On the Velocity of Sound in an Elastic Tube as Influenced by the Elasticity of the Walls", he considered a compressible inviscid fluid in a thin-walled elastic tube, took a wave-equation for the pressure inside, and obtained a "frequency-equation" for the velocity in terms of the dimensions of the tube and the elastic constants of the material. For a gas in a metal tube the correction is negligible, but he remarks

> "for the other extreme, e.g., water in an india rubber tube, we have two values for c, $(hE/2a\rho_0)^{1/2}$ and $(B/\rho)^{1/2}$".

In these expressions h is the thickness of the tube, a its radius and ρ its density. E is Young's Modulus and B is $E/(1-\sigma^2)$. where σ is Poisson's Ratio. ρ_0 is the density of the liquid.

Lamb adds that the former value of c is the same as the velocity of the pulse-wave as deduced theoretically by Résal (quoted by Korteweg in Liouville's Journal in 1876). It is apparent from Lamb's results that if the wavelength is long compared with the circumference of the tube, the velocity is independent of frequency. We show below that this does not hold if the viscosity of the liquid is taken into account. Let R be the radius of the tube, h its thickness, ρ the density of the material, ρ_0 the density of the liquid. Take the axis of z along the tube, and let ζ be the displacement along the axis, ξ be the radial displacement. For the elastic constants take B to be $E/(1-\sigma^2)$ as above, where E is Young's modulus and σ Poisson's Ratio. Then the extensions are

$$\frac{\partial\zeta}{\partial z} \text{ along } z, \text{ and } \frac{\xi}{R} \text{ radial.}$$

The tensions are P along z, and Q radial, so that

$$P = Bh\left\{\frac{\partial\zeta}{\partial z} + \sigma\frac{\xi}{R}\right\}, \qquad 3.1$$

$$Q = Bh\left\{\frac{\xi}{R} + \sigma\frac{\partial\xi}{\partial z}\right\} \qquad 3.2$$

Lamb gives the equations of motion

$$\rho h \frac{\partial^2 \zeta}{\partial t^2} = \frac{\partial p}{\partial z} \qquad 3.3$$

$$\rho h \frac{\partial^2 \xi}{\partial t^2} = p - \frac{Q}{R} \qquad 3.4$$

where p is the excess pressure on the inner surface, but if the liquid is viscous there will be a surface traction on the inner surface of the tube due to viscous drag, and eqn. 3.3 must be modified. If w is the longitudinal component of the velocity of the liquid and u its radial component, the surface traction per unit area will be

$$\mu\left(\frac{\partial w}{\partial r} + \frac{\partial u}{\partial z}\right)_{r=R} \qquad 3.5$$

where μ is the viscosity of the liquid. Making this modification to eqn. 3.3 and inserting the values of P and Q from 3.1 and 3.2 the equations of motion of the tube become

$$\frac{\partial^2 \zeta}{\partial t^2} = \frac{\rho_o}{\rho}\frac{\nu}{hR}\left(\frac{\partial w}{\partial y} + R\frac{\partial u}{\partial z}\right)_{y=1} + \frac{B}{\rho}\left(\frac{\partial^2 \zeta}{\partial z^2} + \frac{\sigma}{R}\frac{\partial \xi}{\partial z}\right), \qquad 3.6$$

$$\frac{\partial^2 \xi}{\partial t^2} = \frac{p}{h\rho} - \frac{B}{\rho}\left(\frac{\sigma}{R}\frac{\partial \zeta}{\partial z} + \frac{\xi}{R^2}\right) \qquad 3.7$$

together with the boundary conditions for the motion of the liquid

$$u = \frac{\partial \xi}{\partial t} \text{ at } y = 1, \qquad 3.8$$

$$w = \frac{\partial \zeta}{\partial t} \text{ at } y = 1. \qquad 3.9$$

In the usual notation the equations of motion of the liquid are

$$\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial r} + w\frac{\partial u}{\partial z} = -\frac{1}{\rho_0}\frac{\partial p}{\partial r} + \nu\left[\frac{\partial^2 u}{\partial r^2} + \frac{1}{r}\frac{\partial u}{\partial r} + \frac{\partial^2 u}{\partial z^2} - \frac{u}{r^2}\right], \qquad 3.10$$

$$\frac{\partial w}{\partial t} + u\frac{\partial w}{\partial r} + w\frac{\partial w}{\partial z} = -\frac{1}{\rho_0}\frac{\partial w}{\partial z} + \nu\left[\frac{\partial^2 w}{\partial r^2} + \frac{1}{r}\frac{\partial w}{\partial r} + \frac{\partial^2 w}{\partial z^2}\right]. \qquad 3.11$$

together with the equation of continuity

$$\frac{\partial u}{\partial r} + \frac{u}{r} + \frac{\partial w}{\partial z} = 0 \qquad 3.12$$

If a trial solution is taken in which all the variables vary as $\exp[in(t-z/c)]$, we shall be concerned with the type of motion in which $u/c, w/c$ and nR/c are all small. It is clear from the equation of continuity that u, the radial component of velocity, will be of order nR/c compared with w, the velocity along the tube. It follows that the non-linear terms are in general of order $1/c$ compared with the main linear terms, and we therefore neglect the inertia terms in the first approximation. Let

$$p = p_1 \exp[in\ (t-z/c)],$$
$$u = u_1 \exp[in\ (t-z/c)],$$
$$w = w_1 \exp[in\ (t-z/c)],$$

Equations 3.10 and 3.11 reduce to

$$\frac{d^2u_1}{dy^2} + \frac{1}{y}\frac{du_1}{dy} + i^3\alpha^2u_1 - \frac{u_1}{y^2} = \frac{1}{R}\cdot\frac{R^2}{\mu}\cdot\frac{dp_1}{dy}, \tag{3.13}$$

$$\frac{d^2w_1}{dy^2} + \frac{1}{y}\frac{dw_1}{dy} + i^3\alpha^2w_1 = \frac{in}{c}\cdot\frac{R^2}{\mu}\cdot p_1 \tag{3.14}$$

where the terms in $\partial^2w/\partial z^2$, $\partial^2u/\partial z^2$, have been omitted, since n^2R^2/c^2 is small (see below)

The equation of continuity is

$$\frac{1}{y}\frac{d}{dy}(u\ y) = \frac{inR}{c}w_1 \tag{3.15}$$

If now it is assumed that $p_1 = AJ_0(ky)$, where k is to be determined, the equations of motion can be integrated to give

$$w_1 = C_1\frac{J_0(\alpha i^{3/2}y)}{J_0(\alpha i^{3/2})} - \frac{inR^2}{c\mu}\frac{A_1}{i^3\alpha^2 - k^2}J_0(ky), \tag{3.16}$$

$$u_1 = C_2\frac{J_1(\alpha i^{3/2}y)}{J_0(\alpha i^{3/2})} - \frac{R}{\mu}\cdot k\cdot\frac{A_1}{i^3\alpha^2 - k^2}J_1(ky) \tag{3.17}$$

where C_1 and C_2 are arbitrary constants, and the constant $J_0(\alpha i^{3/2})$ has been introduced (by analogy with the simple theory for the rigid tube) for convenience. If these values of u_1 and w_1 are inserted in the equation of continuity it should reduce to an identity. From 3.16 and 3.17

$$\frac{inR}{c}w_1 = \frac{inR}{c}C_1\frac{J_0(\alpha i^{3/2}y)}{J_0(\alpha i^{3/2})} - \frac{i^2n^2R^3}{c^2\mu}\frac{A}{i^3\alpha^2 - k^2}J_0(ky), \tag{3.18}$$

$$\frac{1}{y}\frac{d}{dy}(u,y) = \alpha i^{3/2}C_2\frac{J_0(\alpha i^{3/2}y)}{J_0(\alpha i^{3/2})} - \frac{Rk^2}{\mu}\cdot\frac{A}{i^3\alpha^2 - k^2}J_0(ky) \tag{3.19}$$

For the equation of continuity to be satisfied these must be identical, and therefore $k = inR/c$ and $C_2/C_1 = inR/c\alpha i^{3/2}$, so that $J_0(ky)$ becomes $I_0(nR/c)$ and $J_1(ky)$ becomes $iI_1(nR/c)$.

At the highest frequencies likely to be of interest in the pulse-wave, n^2R^2/c^2 is small compared with α^2. As an example, for the sixth harmonic of the pulse frequency of the dog, $n^2R^2/c^2 \sim 6 \times 10^{-4}$ and the ratio of this to the corresponding value of α^2 is about 9×10^{-6}. It is therefore justifiable to replace $i^3_2\alpha^2-k^2$ in 3.16 and 3.17 by $i^3\alpha^2$, and in view of the smallness of nR/c to use the approximations $I_0(nR/c)=1$ and $I_1(nRy/c)=nRy/2c$. This is the same degree of approximation that is implicit in omitting the terms $\partial^2 w/\partial z^2$ and $\partial^2 u/\partial x^2$ from the equations of motion. Inserting these approximations in the expressions for the velocity-components,

$$w_1 = C_1 \frac{J_0(\alpha i^{3/2}y)}{J_0(\alpha i^{3/2})} + \frac{A_1}{\rho_0 c}, \qquad 3.20$$

$$u_1 = \frac{inR}{2c}\left[C_1 \frac{2J_1(\alpha i^{3/2}y)}{\alpha i^{3/2}J_0(\alpha i^{3/2})} + y \cdot \frac{A_1}{\rho_0 c}\right] \qquad 3.21$$

At the inner surface of the tube, i.e., when $y = 1$,

$$w_1 = C_1 + \frac{A_1}{\rho_0 c} \qquad 3.22$$

$$u_1 = \frac{1}{2} \cdot \frac{inR}{c} \cdot C_1 \cdot F_{10}(\alpha) + \frac{1}{2} \cdot \frac{inR}{c} \quad \frac{A}{\rho_0 c} \qquad 3.23$$

where $F_{10}(\alpha)$ has been written for $2J_1(\alpha i^{3/2})/\alpha i^{3/2}J_0(\alpha i^{3/2})$, the function of α which appears in the expression for the rate of flow in the simple theory. The value of $\partial w_1/\partial y$ at $y = 1$ is also needed, to substitute in the equations of motion of the tube. Making the same approximations, this is

$$-\frac{C_1}{2} \cdot i^3\alpha^2 F_{10}(\alpha) + \frac{1}{2}\frac{n^2R^2}{c^2} \cdot \frac{A_1}{\rho_0 c} \qquad 3.24$$

If it is now assumed that

$$\xi = D_1 \exp[in(t-z/c)],$$
$$\zeta = E_1 \exp[in\ t-z/c\ ],$$

where D_1 and E_1 are arbitrary constants, the boundary conditions for u_1 and w_1 become

$$in\,E_1 = C_1 + \frac{A_1}{\rho_0 c} \tag{3.25}$$

$$in\,D_1 = \frac{1}{2}\,\frac{inR}{c}\left\{F_{10}(\alpha)\cdot C_1 + \frac{A_1}{\rho_0 c}\right\} \tag{3.26}$$

and the equations of motion of the tube become

$$-n^2 D_1 = \frac{A}{h\rho} - \frac{B}{\rho}\left\{\frac{\sigma}{R}\left(-\frac{inE_1}{c}\right) + \frac{D_1}{R^2}\right\}, \tag{3.27}$$

$$\begin{aligned} -n^2 \cancel{K_1}\,E_1 = {} & -\frac{\rho_0}{\rho}\cdot\frac{\nu}{hR}\left\{-\frac{C_1}{2}\cdot i^3\alpha^2 F_{10}(\alpha) + \frac{1}{2}\,\frac{A_1}{\rho_0 c}\cdot\frac{n^2R^2}{c^2}\right\} \\ & + \frac{B}{\rho}\left\{-\frac{n_2}{c^2}E_1 + \frac{\cancel{\nu}\,\sigma}{R}\left(-\frac{in}{c}\right)D_1\right\} \end{aligned} \tag{3.28}$$

In 3.28 the term in $\partial u/\partial z$ in 3.6 has been omitted, since it is of order n^2R^2/c^2.

Equations 3.25-3.28 are four homogeneous equations in the arbitrary constants A_1, C_1, D_1, E_1. Eliminating them will give a 'frequency equation' which will determine the wave-velocity c in terms of the elastic properties of the tube and the non-dimensional parameter α. The result of the elimination is

$$0 = \begin{vmatrix} 1/\rho_0 c & 1 & 0 & -in \\ inR/2\rho_0 c^2 & \overset{(F_0(\omega))}{inR/2c} & -in & 0 \\ 1/h\rho & 0 & n^2 - B/\rho R^2 & in\sigma B/cR\rho \\ \frac{1}{2}\cdot\frac{\rho_0}{\rho}\cdot\frac{\nu}{hR}\cdot\frac{1}{\rho_0 c}\cdot\frac{n^2R^2}{c^2} & -\frac{i}{2}\cdot\frac{\rho_0}{\rho}\,\frac{\nu\alpha^2}{hR}F_{10} & -\frac{in}{c}\cdot\frac{\sigma}{R}\cdot\frac{B}{\rho} & n^2\left(1-\frac{B}{\rho c^2}\right) \end{vmatrix} \tag{3.29}$$

The first step in the evaluation of this determinant is to make all the elements non-dimensional. The term $-i\rho_0\nu\alpha^2F_{10}/2\rho hR$ is replaced by its equivalent $-in\rho_0 RF_{10}/2\rho h$, since $\nu\alpha^2 = nR^2$. If now the first column is divided by $\rho_0 c$, the second column by inR/c, fourth column by $-in$, and the fourth row by in, the determinant becomes

$$\begin{vmatrix} 1 & 1 & 0 & 1 \\ 1/2 & 1/2F_{10} & -1 & 0 \\ R\rho_0/h\rho & 0 & -B/\rho c^2 & -\sigma B/\rho c^2 \\ 0 & -F_{10}R\rho_0/2h\rho & -\sigma B/\rho c^2 & 1-B/\rho c^2 \end{vmatrix} \tag{3.30}$$

At this stage the following further approximations have been made. In the third row, third term, n^2R^2/c^2 has been neglected in comparison with $B/\rho c^2$. This is justified, since $(B/\rho)^{\frac{1}{2}}$ is the velocity of shear-waves in the material of the tube, and this will be greater than the pulse-velocity, so that $B/\rho c^2 > 1$, and n^2R^2/c^2 can be neglected in comparison with it. The first term of the fourth row is of order $n^2R^2/c^2\alpha^2$ and can therefore be neglected. If now we write $k = h\rho/R\rho_0$, $\boxed{x = kB/\rho c^2}$, and reduce the order of the determinant by replacing the second row by Row 1 - 2xRow 2) and the third row by (Row 1 - Row 3) the equation becomes

$$0 = \begin{vmatrix} 1 - F_{10} & 2 & 1 \\ 1 & x & 1+\sigma x \\ -\frac{1}{2}F_{10} & -\sigma x & (k-x) \end{vmatrix}$$

which reduces to

$$0 = (1 - \sigma^2)(1 - F_{10})\,x^2 - x\,\{2 + k(1 - F_{10}) + F_{10}(\tfrac{1}{2} - 2\sigma)\} + F_{10} + 2k. \qquad 3.31$$

In this equation $k \ll 1$ since the tube is assumed to be thin-walled, and in the application to the arteries $\rho = \rho_0$.

When $\alpha \to \infty$, i.e., as the viscosity of the liquid $\to 0$, $F_{10} \to 0$ and the roots of this equation tend to equality with those of the corresponding equation which can be deduced from Lamb's equation for the compressible fluid. An equation which is essentially the same as 3.31 has been given by Morgan and Kiely (1954) in a somewhat different notation. They give two approximate solutions, one for "small viscosity", by using the asymptotic expansions of the Bessel Functions, and the other for "large viscosity", by using the power series, but do not seem to have appreciated the dependence of the wave-velocity on the single non-dimensional parameter, α.

The roots of 3.31 are given by

$$(1 - \sigma^2)x = G \pm \sqrt{\{G^2 - (1 - \sigma^2)H\}} \qquad 3.32$$

where

$$G = \frac{1 + \frac{1}{4} - \sigma}{1 - F_{10}} + (k/2 + \sigma - \tfrac{1}{4}), \qquad 3.33$$

$$H = (1 + 2k)/(1 - F_{10}) - 1. \qquad 3.34$$

In terms of the notation used in 2.13 above, $1/(1-F_{10}) = \exp(-i\varepsilon)/M'_{10}$ so that

the quantities required to compute the roots are already available. Since $F_{10}(\alpha)$ is complex, x is always complex, and the motion is either damped or unstable. The sign of arg x is determined by that of arg G, and since arg G is always negative, the motion is damped. If we write

$$\{(1-\sigma^2)x/2\}^{1/2} = X - iY. \qquad 3.35$$

and denote by c_0 the velocity for the perfect fluid, i.e., write $C_0 = (hE/2R\rho_0)^{\frac{1}{2}}$, then if c_1 is the wave-velocity, $c_0/c_1 = X$ and over a distance of one wave-length the amplitude will be reduced in the ratio $\exp(-2\pi Y/X)$. The quantities of practical interest are, therefore, $1/X$, which gives the ratio of the velocity to that for the perfect fluid, and $\exp(-2\pi Y/X)$.

The tables in Appendix I, which were computed by the Computation Laboratory of Harvard University, give these quantities, together with those required for the calculation of the motion of the wall, for a range of values $\alpha = 1(0.05)10$; $k = 0, 0.1, 0.2, 0.3, 0.4$; $\sigma = 0, 1/4, 1/2$. They also contain tables for $\sigma = 1/2$. $k = -1, -2. -5, -10$; which are discussed in Section IV. Table 4 gives their values, together with the reduction in amplitude over a distances of 10 cm, for the first four harmonics of the pulse of the pulse of the dog, in the femoral artery. They have been calculated for $k = 0.1$, i.e., for a wall-thickness of one-tenth of the radius, for $\sigma = 1/2$ and $\sigma = 0$. In this table, $f_1 = \exp(-2\pi Y/X)$ and $f_2 = \exp(-2\pi Yz/X\lambda)$, with $z = 10$ cm.

Table 5

	$\sigma = 1/2$			$\sigma = 0$		
α	c/c_0	f_1	f_2	c/c_0	f_1	f_2
3.34	0.914	0.274	0.946	0.842	0.132	0.917
4.72	0.924	0.472	0.938	0.876	0.294	0.900
5.78	0.936	0.565	0.929	0.894	0.381	0.883
6.67	0.942	0.636	0.925	0.906	0.442	0.870

The amount of damping seems rather large. A diminution in amplitude of 5-6% over so short a length of 10 cm one would expect to have been observed and remarked upon, but until more accurate observations are available it is not possible to say with certainty that this degree of damping is greater than that which exists in

the arterial system. In practical observation it might well be masked by the change in shape of the pulse as it travels. Figure 9, which shows the relationship between α and $\exp(-2\pi Y/X)$, illustrates how much greater the damping is for the smaller values of σ. Figure 8, which shows $1/X = c/c_0$ against α, demonstrates that

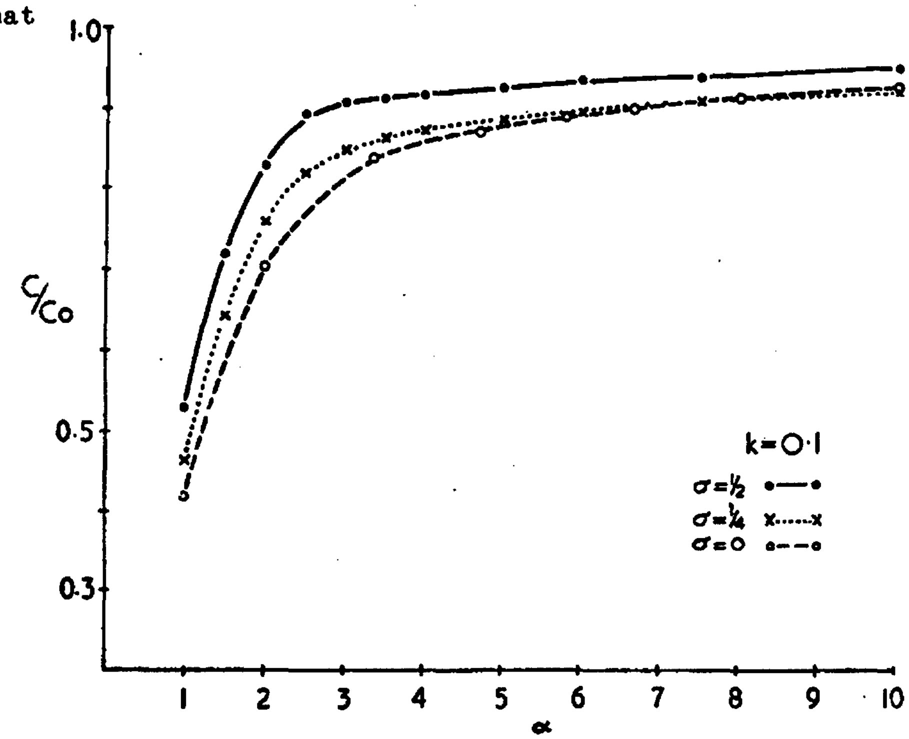


Fig.8 Ratio of wave-velocity to that for an inviscid fluid as a function of α, for a wall-thickness ratio of 0.1 and Poisson's Ratios of 0.5, 0.25, 0.

for values of α greater than 3, which are those of greatest practical interest, the change in velocity with α is quite small, being somewhat larger the smaller is the value of σ. Since the wave-velocity varies with frequency, energy will be transmitted with the group-velocity, and it is the group-velocity that will be observed when the pulse-velocity is measured. If a wave-motion is described by the form $\exp[i(nt-mz)]$, the group velocity c_g is given by $c_g = dn/dm$. In terms of α and X this may be written

$$\frac{c_0}{c_g} = \frac{c_0}{c_1}\left(1 - \frac{\alpha}{2X}\frac{dX}{d\alpha}\right).$$

The analytical form for $dX/d\alpha$ is unsuitable for computation. Figure 8 shows a graph of log X against log α, and since

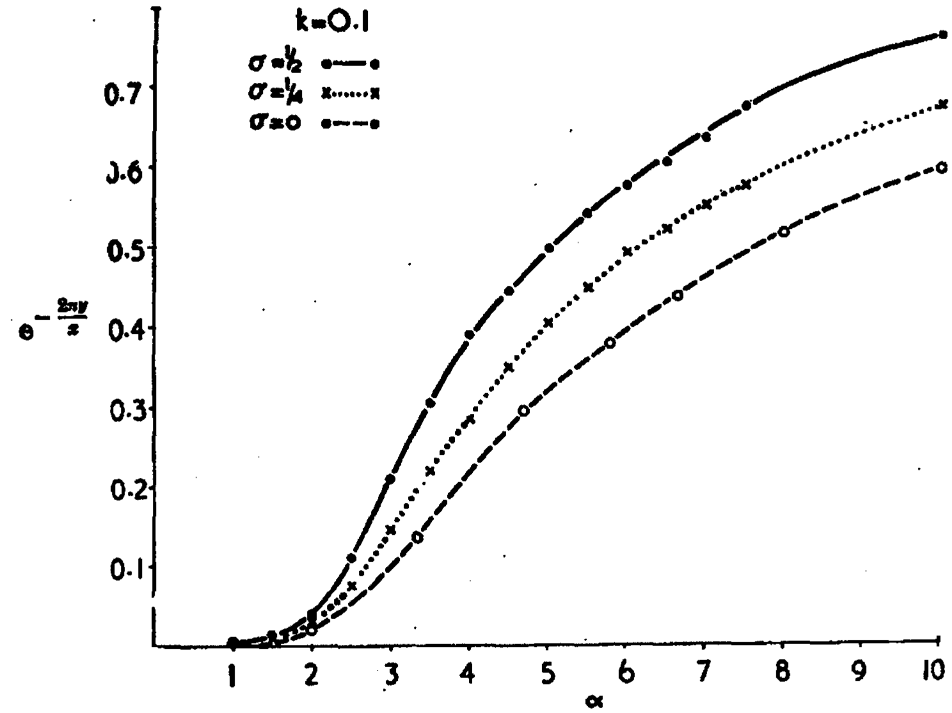


Fig. 9 Attenuation of wave amplitude over one wave-length as a function of α , for the same conditions as Fig. 8.

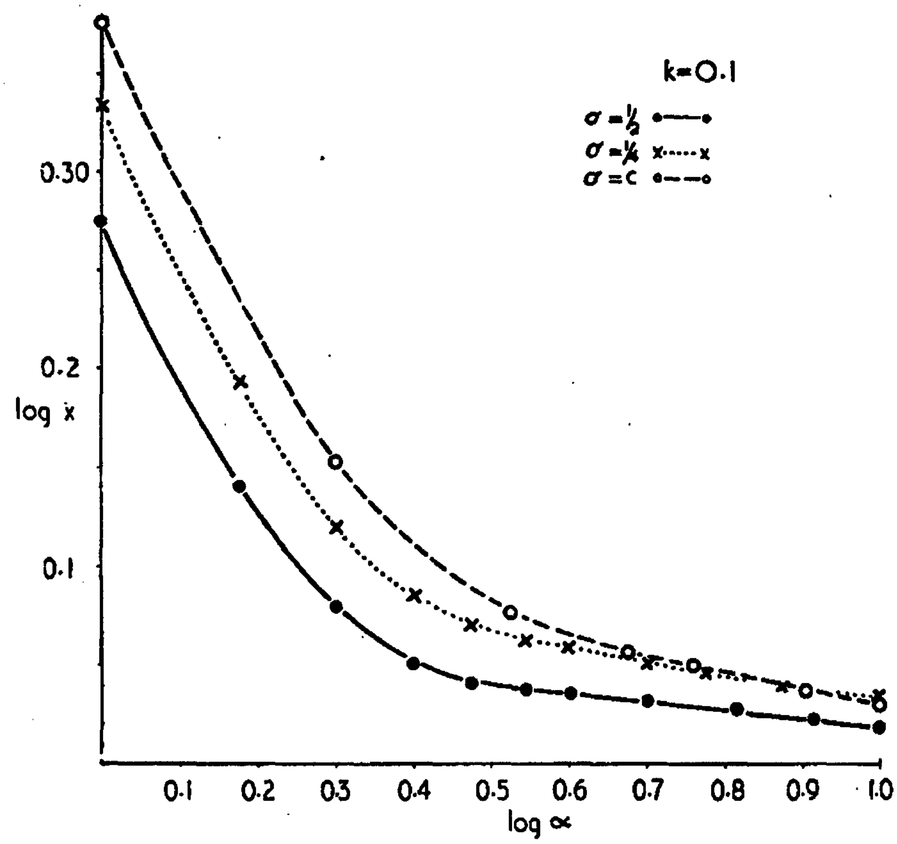


Fig. 10 Variation of log X with log α.

$$\frac{\alpha}{X}\frac{dX}{d\alpha} = \frac{d(\log X)}{d(\log \alpha)}$$

it is possible from this to estimate its magnitude. It will be seen from the graph that for those values of α which apply to the femoral artery ($3<\alpha<7$), $d(\log X)/d(\log \alpha)$ is about -0.045, so that for these conditions c_g/c_i is about 0.98, so that the difference is only 2%, and over the range $\alpha = 3$ to $\alpha = 4$ is certainly never more than 2½%. Until accurate measurements of pulse-velocity are made over short lengths of artery, this effect is not likely to be worth taking into account.

SECTION IV
THE MODIFICATION OF THE EQUATIONS OF MOTION
FOR
ADDITIONAL MASS, ELASTIC CONSTRAINT, AND INTERNAL VISCOUS DAMPING

As a model of the mammalian arteries, the freely-moving elastic tube is inadequate in a number of ways. As will be seen later, when the motion of the liquid and the pressure-diameter equation is discussed in detail, it predicts a longitudinal motion of the wall which is almost certainly too large to be practicable, and has, in fact, never been observed. It is known that the arteries are attached to, and supported by, other tissues. It is also known that the material of the wall is not perfectly elastic. Lawton (1954) has demonstrated that it has considerable internal damping.

No very drastic change in the equations is needed to take account of these factors in a simple manner. Morgan and Ferrante (1955) showed that if the tube has additional mass attached to it which takes no part in the elastic deformation the form of the equations is unchanged. It was assumed by them that this additional mass is uniformly distributed and is cylindrical in shape. The only modification required is that the thickness of the tube, h, be replaced by

$$H = h\left(1 + \frac{h_1}{h}\,\frac{\rho_1 R_1}{\rho R}\right) \qquad 4.1$$

where h_1, ρ_1, R_1 are the thickness, density, and mean radius of the added mass.

If, together with this additional mass we now introduce an elastic constraint of natural frequency $m/2\pi$ to reduce the longitudinal motion of the wall, the equation of motion for the longitudinal displacement becomes

$$\ddot{\zeta} + m^2\xi = -\frac{\rho_\alpha}{\rho}\cdot\frac{\nu}{hR}\cdot\left(\frac{\partial\omega}{\partial y}\right)_{y=1} + \frac{Bh}{H\rho}\left(\frac{\partial^2\zeta}{\partial z^2} + \frac{\sigma}{R}\,\frac{\partial\xi}{\partial z}\right) \qquad 4.2$$

If this equation is used instead of its counterpart in the freely-moving tube, the form of the frequency equation is unchanged. The only modification required is a change in the definition of k, the wall-thickness ratio, which is replaced by

$$k' = \frac{h}{R}\cdot\frac{H}{h}\cdot\left(1 - \frac{m^2}{n^2}\right) \qquad 4.3$$

Thus if the frequency of the oscillation is the same as the natural frequency of the constraint, $k' = 0$ and the tube behaves as though it had no mass. If $m>n$, k' is negative, and if $m>>n$, i.e., if the constraint is very stiff, and the added

mass large, $k \to -\infty$ and the frequency equation reduces to

$$-x + \frac{2}{1-F_{10}} = 0 \qquad 4.4$$

so that

$$(1 - \sigma^2)\frac{k}{2} = \frac{1 - \sigma^2}{1 - F_{10}} \qquad 4.5$$

or

$$\frac{c_c}{c} = \sqrt{\frac{1 - \sigma^2}{1 - F_{10}}}$$

i.e.

$$X = \frac{1 - \sigma^2}{M_{10}'}^{\frac{1}{2}} \cos \frac{\varepsilon_{10}}{2} \qquad 4.6$$

$$Y = \frac{1 - \sigma^2}{M_{10}'}^{\frac{1}{2}} \sin \frac{\varepsilon_{10}}{2} \qquad 4.7$$

and for $\sigma = 1/2$,

$$\frac{c_1}{c_0} = \frac{2}{\sqrt{3}} (M_{10}') \sec \frac{\varepsilon_{10}'}{2} \qquad 4.8$$

$$\frac{2\pi y}{X} = 2\pi \tan \frac{\varepsilon_{10}}{2} \qquad 4.9$$

Graphs of these quantities are shown in Figs. 11 and 12. The curves for $k = 0$, $\sigma = 1/2$ and $k = 0.2$, $\sigma = 1/2$, are shown for comparison. Although the asymptotic value of c_1 for the constrained tube is $1.15\ c_0$, this value is attained very slowly, and for moderate values of α, $c_1 = c_0$, approximately for all $\alpha > 4$.

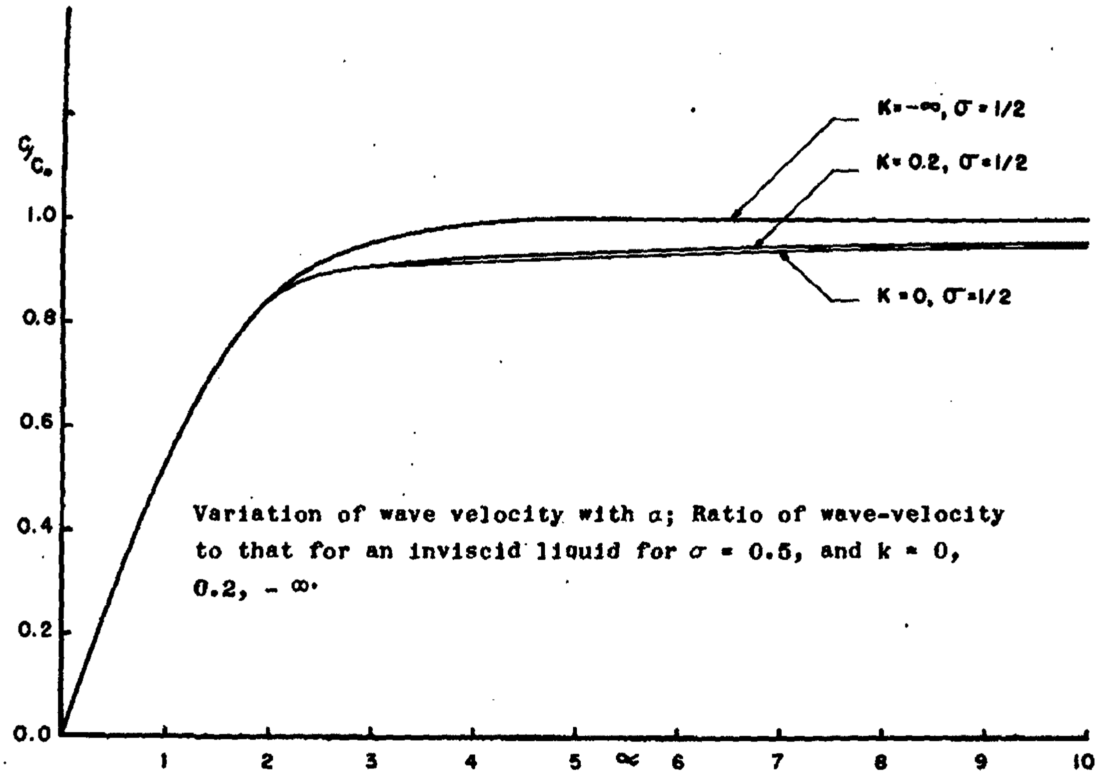
All three curves coincide for $\alpha < 2$, and that for the constrained tube is higher than the other two when $\alpha > 2$. For small k, the variation of c/c_0 with α is not sensitive to variations in k.

Turning now to the modification of the equations to take account of internal damping in the wall of the tube, a simple way of doing this was proposed by Morgan and Kiely (1954). They replaced the elastic constants of the material by

$$E_c = E - in\,E' \qquad 4.11$$

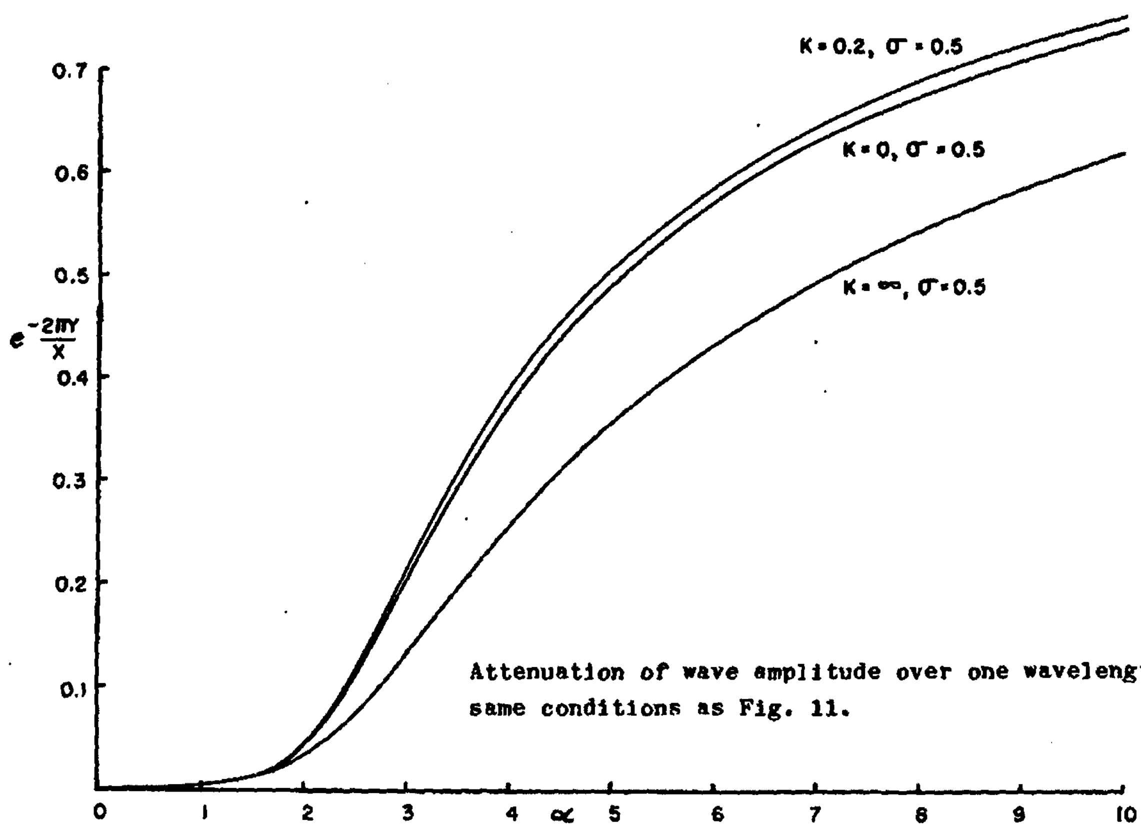
$$\sigma_c = \sigma - in\,\sigma' \qquad 4.12$$

And, substituting these immediately into their approximate formulae for the wave-velocity, demonstrated the effect to be expected from these modifications - an increase in damping, and a reduction in velocity.



Variation of wave velocity with α; Ratio of wave-velocity to that for an inviscid liquid for $\sigma = 0.5$, and $k = 0$, 0.2, $-\infty$.

FIG. 11



Attenuation of wave amplitude over one wavelength for the same conditions as Fig. 11.

FIG. 12

It would seem that there is some difference in sign-convention between this present account and Morgan and Kiely's paper, for the author is of the opinion that the imaginary parts of the above expressions should be positive. For example, consider longitudinal waves in an elastic bar. The equation is

$$\frac{\partial^2 u}{\partial x^2} = a^2 \frac{\partial^2 u}{\partial t^2}$$

where $a^2 = \frac{E}{\rho}$, and a typical solution is

$$u = A e^{in\left(t - \frac{x}{a}\right)}$$

If now we replace E by E_c, where E_c is complex, the imaginary part of E_c must be positive if the motion is to be damped. We therefore write

$$E_c = E\,(1 + in\,\Delta E) \qquad 4.13$$

$$\sigma_c = \sigma\,(1 + in\,\Delta\sigma) \qquad 4.14$$

As a question of principle, since the Poisson's Ratio for arterial tissue is known to be almost exactly one-half, the theoretical maximum, it might be objected that the second of these two expressions gives $|\sigma_c| > 1/2$, and perhaps it ought to be put in the form

$$\sigma_c = \sigma\, e^{in\delta}$$

In what follows, 3.11 will be used. The change to the alternative form is a simple matter, should it be necessary. We now wish to find the effect of these changes on the roots of the frequency-equation. First consider the limiting condition of stiff constraint. This gives

$$\frac{c_0}{c} = \frac{\left(\frac{h}{2R}\,\frac{E}{\rho}\right)^{\frac{1}{2}}}{\left(\frac{h}{2R}\cdot\frac{E}{\rho}\right)^{\frac{1}{2}}} \left\{\frac{1 - \sigma_c^2}{1 - F_{10}}\right\}^{\frac{1}{2}}$$

$$= \left(\frac{1}{1 + in\Delta E}\right)^{\frac{1}{2}} \left\{\frac{1 - \sigma^2 (1 + in\Delta\sigma)^2}{1 - F_{10}}\right\}^{\frac{1}{2}} \qquad 4.15$$

$$= \left(\frac{1 - \sigma^2}{1 - F_{10}}\right)^{\frac{1}{2}} \left\{\frac{\frac{(1 + n\Delta\sigma)^2}{1-\sigma^2} - i\,\frac{2\sigma^2}{1-\sigma^2}\,M\Delta\sigma}{1 + in\Delta E}\right\}^{\frac{1}{2}}$$

If $n\Delta E$ and $n\Delta\sigma$ are small, this may be written

$$\frac{c_0}{c} = \left(\frac{1-\sigma^2}{1-F_{10}}\right)^{\frac{1}{2}} \cdot \left\{1 - in\left(\frac{\Delta E}{2} + \frac{\sigma^2}{1-\delta^2}\Delta\sigma\right)\right\} \qquad 4.16$$

and when $\sigma = 1/2$ this reduces to

$$\frac{c_0}{c} = \left(\frac{3}{4M_{10}'}\right)^{\frac{1}{2}} e^{-i\varepsilon\frac{1}{2}} \left\{1 - in\left(\frac{\Delta E}{2} + \frac{\Delta\sigma}{3}\right)\right\} \qquad 4.17$$

so that the damping of the pulse-wave in transmission is increased, and its velocity is reduced.

The effect of internal damping on the general form of the frequency equation is more complicated. However, if $n\Delta\sigma$ is small, so that second and higher powers can be neglected, it can be shown that the quantity $(1-\sigma^2)^{\frac{X}{2}}$ is replaced by

$$(1-\sigma^2)\frac{X}{2} - in\Delta\sigma \left\{1/2 + \frac{5/3\left(\frac{1}{1-F_{10}} - 1\right) + 4/3\,\frac{k}{1-F_{10}}}{\sqrt{G^2 - (1-\sigma^2)\,H'}}\right\} \qquad 4.18$$

showing that damping is increased, and the velocity reduced.

SECTION V

MODIFICATIONS OF THE EQUATIONS OF MOTION FOR A THIN BOUNDARY LAYER OF LOWER VISCOSITY.

Physiologists who have studied the flow of blood in the smaller vessels have drawn attention to the existence of a region near the wall which is substantially free from red cells. Such a boundary layer of plasma will have a viscosity less than half that of the rest of the blood in the artery. In the larger vessels, with which the present theory is concerned, the layer, if it exists, will have a thickness very small compared with the radius of the tube. Whilst it might seem at first sight that the introduction of an extra parameter (the thickness of the bounding layer) would make the theory completely formless, and enable any desired result to be obtained at will, it is shown below that, if the thickness of the boundary-layer is allowed to tend to zero, the basic equations are only slightly modified, and, in particular, for the limiting condition of heavy loading and stiff constraint, reduce to those of the previous section. At the other extreme, if the tube is free to move, and of negligible mass, the presence of the infinitesinal layer causes a marked reduction, both in pulse-velocity and in damping.

The viscosity of plasma will be denoted by μ_0, so that if the non-dimensional parameter of the motion of the blood is α, that of the motion of the plasma layer will be β, where $\beta = \alpha(\mu/\mu_0)^{½}$. We assume that the liquid within the tube is blood when $0 \leq y \leq y_0$ and plasma when $y_0 \leq y \leq 1$, so that the thickness of the boundary layer is $1-y_0$.

When $0 \leq y \leq y_0$; we have from equation 3.20,

$$w_1 = \frac{A_1}{\rho_0 c} + c_1 \frac{J_0(\alpha y i^{3/2})}{J_0(\alpha y_0 i^{3/2}} \qquad \ldots 5.1.$$

at $y = y_0$,,let $w = w_0$. Then w_0 is unknown, but is determined later from the condition that the velocity must be continuous across the boundary $y = y_0$. C_1 can be determined in terms of w_0 and

$$w_1 = \frac{A_1}{\rho_0 c} + \left(w_0 - \frac{A_1}{\rho_0 c}\right) \frac{J_0(\alpha y i^{3/2})}{J_0(\alpha y_0 i^{3/2})} \qquad \ldots 5.2.$$

The velocity gradient at $y = y_0$ is

$$\left(\frac{dw_1}{dy}\right)_{y=y_o} = -\left(w_o - \frac{A_1}{\rho_o c}\right) \cdot \frac{i^3 \alpha^2}{2} F_{10}(\alpha y_o) \qquad \ldots 5.3.$$

where F_{10} has the same meaning as in 3.23. In the boundary layer $y_o \leq y \leq 1$ the velocity will be

$$w = \frac{A_1}{\rho_o c} + c_2 \frac{J_o(\beta y i^{3/2})}{J_o(\beta i^{3/2})} + c_3 \frac{K_o(\beta y i^{1/2})}{K_o(\beta i^{1/2})} \qquad \ldots 5.4.$$

The extra term has to be included, since the condition that w is finite at y=0 no longer applies, and boundary conditions have to be fitted at $y=y_o$ and at y=1. At y=1, 3.22 is replaced by

$$inE_1 = \frac{A_1}{\rho_o c} + c_2 + c_3 \qquad \ldots 5.5.$$

and at $y=y_o$.

$$w_o - \frac{A_1}{\rho_o c} = c_2 \frac{J_o(\beta y_o i^{3/2})}{J_o(\beta i^{3/2})} + c_3 \frac{K_o(\beta y_o i^{1/2})}{K_o(\beta i^{1/2})} \qquad \ldots 5.6.$$

Also at $y=y_o$

$$\left(\frac{dw_1}{dy}\right)_{y=y_o} = -c_2 \frac{\beta i^{3/2} . J_1(\beta y_o i^{3/2})}{J_o(\beta i^{3/2})} + c_3 \frac{\beta i^{1/2} K_1(\beta y_o i^{1/2})}{K_o(\beta i^{1/2})} \qquad \ldots 5.7.$$

and at y=1

$$\left(\frac{dw_1}{dy}\right)_{y=1} = -c_2 \frac{\beta i^{3/2} J_1(\beta i^{3/2})}{J_o(\beta i^{3/2})} + c_3 \frac{\beta i^{1/2} K_1(\beta i^{1/2})}{K_o(\beta i^{1/2})} \qquad \ldots 5.8.$$

w_o and c_3 can now be determined in terms of c_2 by equating the two values of $w_o - \frac{A_1}{\rho_o c}$, i.e., by making the velocity continuous at $y=y_o$ and by equating the two values of the viscous drag at $y=y_o$.

Introducing the notation

$$\frac{2J_1(\beta i^{3/2})}{\beta i^{3/2} J_o(\beta i^{3/2})} = F_{10}(\beta) \qquad \frac{J_o(\beta y_o i^{3/2})}{J_o(\beta i^{3/2})} = F_{10}(\beta)$$

$$\frac{2K_1(\beta i^{1/2})}{\beta i^{1/2} K_o(\beta i^{1/2})} = G_{10}(\beta) \qquad \frac{K_o(\beta y_o i^{1/2})}{K_o(\beta i^{1/2})} = G_{10}(\beta)$$

equations 5.6, 5.7 and 5.8 may be written

$$w_o - \frac{A_1}{\rho_o c} = c_2 F_o(\beta y_o) + c_3 G_{10}(\beta y_o) \qquad \ldots 5.9.$$

$$\left(\frac{dw}{dy}\right)_{y=y_o} = -\frac{c_2}{2} i^3\beta^2 y_o F_{10}(\beta y_o) F_o(\beta y_o) + \frac{c_3}{2} i\beta^2 y_o G_{10}(\beta y_o) . G_{10}(\beta y_o) \qquad \ldots 5.10.$$

$$\left(\frac{dw}{dy}\right)_{y=1} = -\frac{c_2}{2} i^3\beta^2 F_{10}(\beta) - \frac{c_3}{2} i^3\beta^3 G_{10}(\beta) \qquad \ldots 5.11.$$

Equating the two values of the viscous drag at $y=y_o$, and making use of $\mu-\mu_o = (\beta/\alpha_o)^2$ gives

$$\left(w_o - \frac{A_1}{\rho_o c}\right) F_{10}(\alpha y_o) = c_2 F_{10}(\beta) . F_o(\beta y_o) + c_3 G_{10}(\beta y_o) G_{10}(\beta y_o)$$

and therefore, substituting from 5.9 above

$$0 = c_2 F_o(\beta y_o) \left\{ F_{10}(\alpha y_o) - F_{10}(\beta y_o) \right\} + c_3 G_o(\beta y_o) \left\{ F_{10}(\alpha y_o) - G_{10}(\beta y_o) \right\}$$

and therefore

$$c_3 = -c_2 \frac{F_o(\beta y_o)}{G_o(\beta y_o)} \left[\frac{F_{10}(\alpha y_o) - F_{10}(\beta y_o)}{F_{10}(\alpha y_o) - G_{10}(\beta y_o)}\right]$$

The boundary conditions for the motion of the elastic tube can now be re-written in terms of c_2. Equation 5.5 (which replaces 3.22) becomes

$$inE_1 = \frac{A_1}{\rho_o c} + c_2 \left[1 - \frac{F_o(\beta y_o)}{G_o(\beta y_o)} . \frac{F_{10}(\alpha y_o) - F_{10}(\beta y_o)}{F_{10}(\alpha y_o) - G_{10}(\beta y_o)}\right] \qquad \ldots 5.12.$$

and 5.11 becomes

$$\left(\frac{dw_1}{dy}\right)_{y=1} = -\frac{c_2}{2} i^3\beta^2 \left[F_{10}(\beta) + G_{10}(\beta) \frac{F_o(\beta y_o)}{G_o(\beta y_o)} . \frac{F_{10}(\alpha y_o) - F_{10}(\beta y_o)}{F_{10}(\alpha y_o) - G_{10}(\beta y_o)}\right]$$

If $y_o \to 1$ this becomes

$$\left(\frac{dw}{dy}\right)_{y=1} = -\frac{c_2}{2} i^3\beta^2 F_{10}(\beta)$$

as it should. If also $y_o \to 1$ in 5.12 it becomes

$$\text{inE}_1 = \frac{A_1}{\rho_o c} + c_2 \cdot \frac{F_{10}(\beta)-G_{10}(\beta)}{F_{10}(\alpha)-G_{10}(\beta)}$$

If now we write

$$c_2' = c_2 \frac{F_{10}(\beta)-G_{10}(\beta)}{F_{10}(\alpha)-G_{10}(\beta)}$$

equations 3.25 - 3.28 remain the same, except that in 3.28, $\alpha^2 F_{10}(\alpha)$ is to be replaced by

$$\beta^2 F_{10}(\beta) \cdot \frac{F_{10}(\alpha)-G_{10}(\beta)}{F_{10}(\beta)-G_{10}(\beta)}$$

i.e., by $\alpha^2 F_{10}(\alpha)\ L(\alpha,\beta)$

where $$L(\alpha,\beta) = \frac{\beta^2}{\alpha^1} \frac{1-\dfrac{G_{10}(\beta)}{F_{10}(\alpha)}}{1-\dfrac{G_{10}(\beta)}{F_{10}(\beta)}}$$

The frequency equation becomes

$$(1-\sigma^2)x^2 - 2G'x + H' = 0$$

in which

$$G' = \frac{(1-\sigma/2)+L(1/4-\sigma/2)}{1-F_{10}(\alpha)} + \frac{k}{2} + \frac{\sigma}{2} + L(\tfrac{1}{2}-\sigma)$$

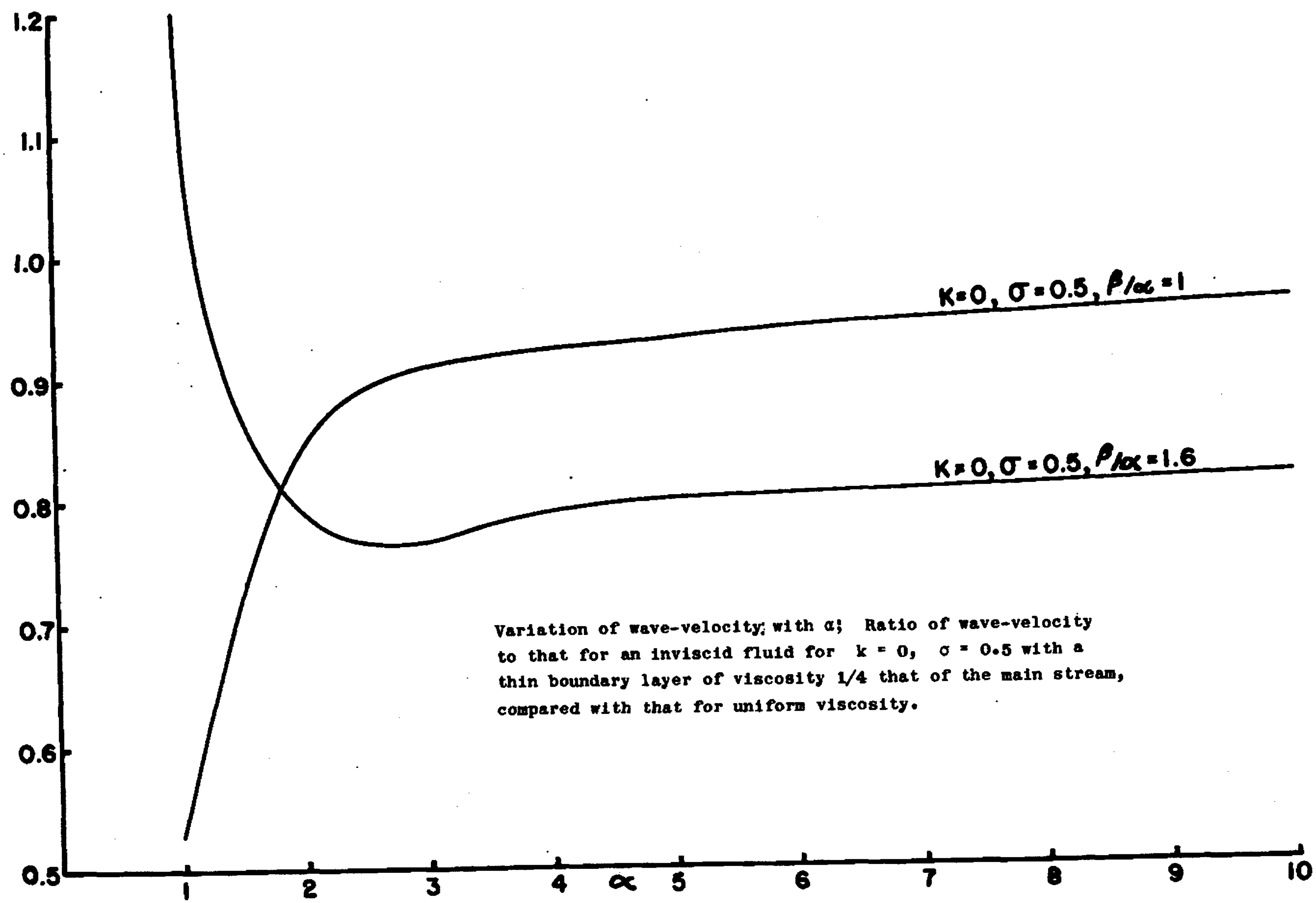
$$H' = L\left(\frac{1}{1-F_{10}(\alpha)} - 1\right) + \frac{2k}{1-F_{10}(\alpha)}$$

In the limiting conditions of heavy loading and stiff constraint ($k \to -\infty$) the terms in $L(\alpha_1\beta)$ will have no effect, and the presence of the low viscosity layer will affect neither the pulse velocity nor the damping in transmission. When $\sigma=\frac{1}{2}$, G' is the same as G in equation 3.33 and the effect of $L(\alpha_1\beta)$ on the roots of the equation will be confined to its effect on H'. This will be greatest when $k=0$, i.e., when

$$H' = L(\alpha_1\beta)\left(\frac{1}{1-F_{10}} - 1\right)$$

Fig. 13 shows c/c_o against α for $k=0$, $\sigma=0.5$, $\beta/_\alpha=1.6$, which is very close to the correct value if the layer is assumed to be pure plasma. The ratio $c/_{c_o}$ is

reduced very considerably by the presence of the boundary layer, and the form of the relationship between c/c_0 and α is changed completely. It would seem, therefore, that if the simple theory which assumes conditions of limiting constraint should prove to be inadequate, the consequences of the assumption of a boundary layer of low viscosity will have to be explored further.



Variation of wave-velocity with α; Ratio of wave-velocity to that for an inviscid fluid for $k = 0$, $\sigma = 0.5$ with a thin boundary layer of viscosity 1/4 that of the main stream, compared with that for uniform viscosity.

Fig. 13

SECTION VI

THE MOTION OF THE LIQUID

In this section the details of the motion of the liquid at a particular value of z, i.e., over a short length of artery, will be studied. If the origin of z ? is taken at the mid-point of this short length, the longitudinal velocity will be

$$w = \left\{ \frac{A_1}{\rho_0 c} + C_1 \frac{J_0(\alpha y i^{3/2})}{J_0(\alpha i^{3/2})} \right\} e^{int} \qquad 6\text{-}1$$

where the value of C_1 is to be determined from the boundary-conditions. From 3.15, 3.16 and 3.17, D_1 and E_1 can be eliminated. If in the resulting equation η is written for the ratio of C_1 to $A_1/\rho_0 c$, the value of η is

$$\eta = \frac{2}{x(F_{10}-2\sigma)} - \frac{(1-2\sigma)}{F_{10}-2\sigma} \qquad 6.2$$

where x is the root of equation 3.19, and 6.1 becomes

$$w = \frac{A_1}{\rho_0 c} \left\{ 1 + \eta \frac{J_0(\alpha y i^{3/2})}{J_0(\alpha i^{3/2})} \right\} e^{int} \qquad 6.3$$

This shows that for a given applied pressure-function the velocity of the liquid is inversely proportional to the wave velocity.

We may split up the constant $A_1/\rho_0 c$ into factors:-

$$\left(\frac{-in}{c}\right) \cdot \frac{1}{\rho_0} \cdot \left(-\frac{1}{in}\right) \cdot A_1$$

and therefore if A_1' is the quantity that would result from Fourier Analysis of the pressure gradient, we have

$$A_1' = -\left(\frac{-in}{c}\right) A_1$$

and therefore

$$\frac{A_1}{\rho_0 c} = \frac{A_1'}{in\rho_0} = \frac{A_1' R^2}{i\mu\alpha^2} \qquad 6.4$$

This establishes the identity of the constant in 6.3 with that in the simple theory of the rigid tube. The average velocity across the tube is

$$\bar{w} = \frac{A_1}{\rho_0 c} \left\{ 1 + \eta F_{10} \right\} e^{int} \qquad 6.5$$

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and this can be written

$$\bar{w} = \frac{MR^2}{\mu} \frac{M''_{10}}{\alpha^2} \sin (nt - \varphi + \varepsilon''_{10}) \qquad 6.6$$

for a presure gradient $M\cos(nt - \varphi)$, and the values of M''_{10} and ε''_{10} compared with those of M''_{10} and ε''_{10} for the rigid tube. We note that

$$M''_{10} = |1 + \eta F_{10}|$$

$$\varepsilon''_{10} = \text{ph } (1 + \eta F_{10})$$

Tables of these quantities are given in the Appendix.

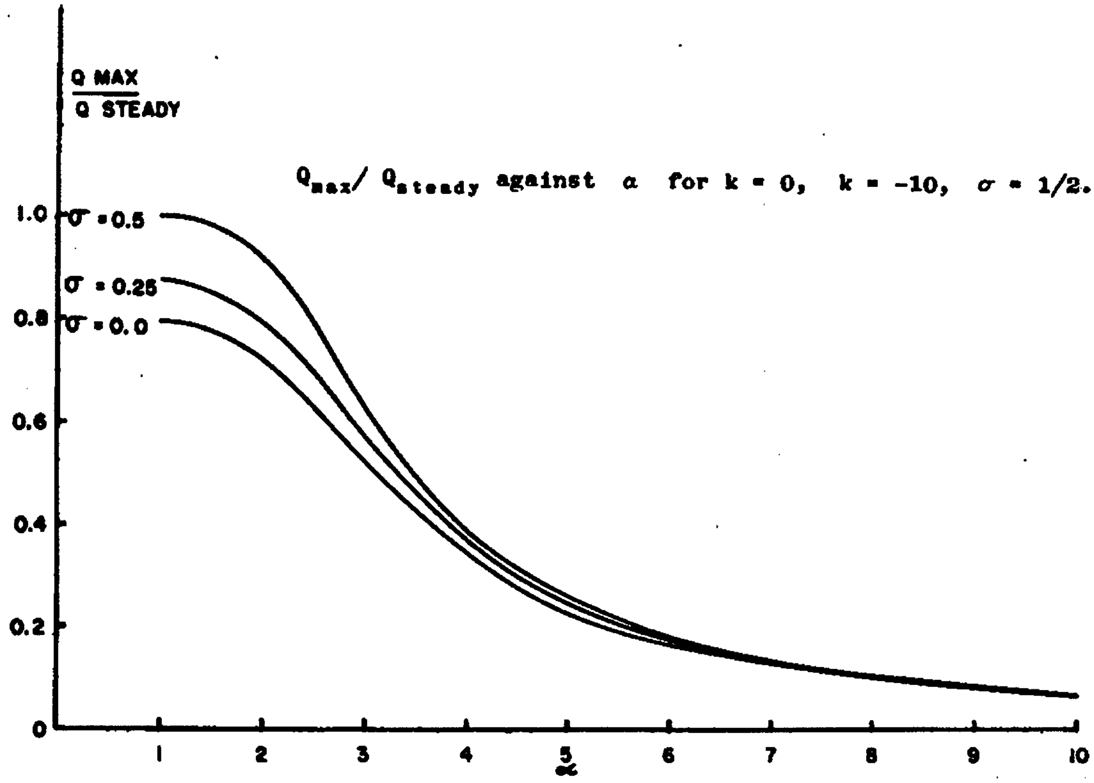
Figs. 14 and 15 show graphs of $\frac{Q_{max}}{Q_{steady}}$ and of the phase-lag against α for $k = 0$, $\sigma = 1/2$, $\sigma = 1/4$, $\sigma = 0$. The curves of Fig. 3 for the rigid tube are not superimposed on these, but in Fig. 3 are shown curves for $\sigma = 1/2$, $k = -10$ for comparison with those of the rigid tube. If in 6.2 we insert

$$x = \frac{2}{1 - F_{10}}$$

it reduces to

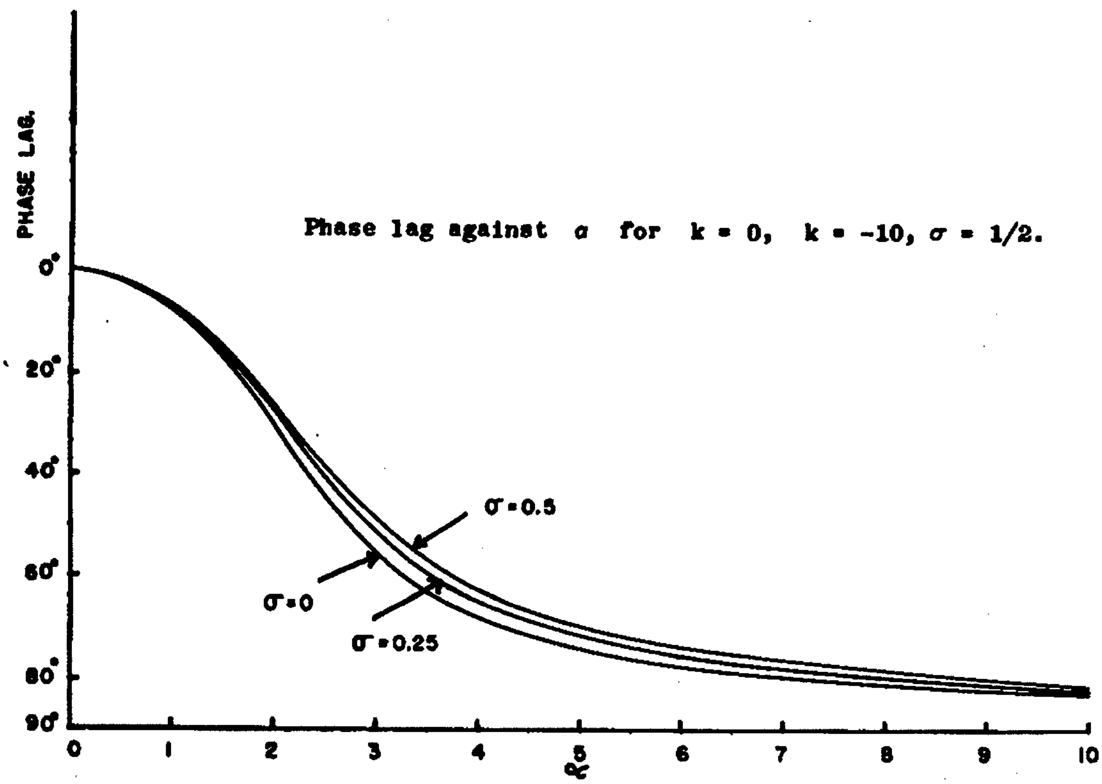
$$\eta = \frac{1 - F_{10}}{F_{10} - 2\sigma} \quad \frac{1 - 2\sigma}{F_{10} - 2\sigma} = -1.$$

so that for the tube in the limiting condition of stiff constraint the motion of the liquid is the same as for the rigid tube. Figs 16, 17 and 18 give comparative plots of the modulus of the complex impedance, fluid resistance, and inductance, for the same conditions as those of Figs 14 and 15.



Q MAX / Q STEADY
Q_{max}/Q_{steady} against α for k = 0, k = -10, σ = 1/2.
1.0
0.8
0.6
0.4
0.2
0
σ = 0.5
σ = 0.25
σ = 0.0
1
2
3
4
5
6
7
8
9
10
α

FIG. 14



PHASE LAG.
Phase lag against α for k = 0, k = -10, σ = 1/2.
0°
20°
40°
60°
80°
90°
σ = 0.5
σ = 0
σ = 0.25
0
1
2
3
4
5
6
7
8
9
10
α

FIG. 15

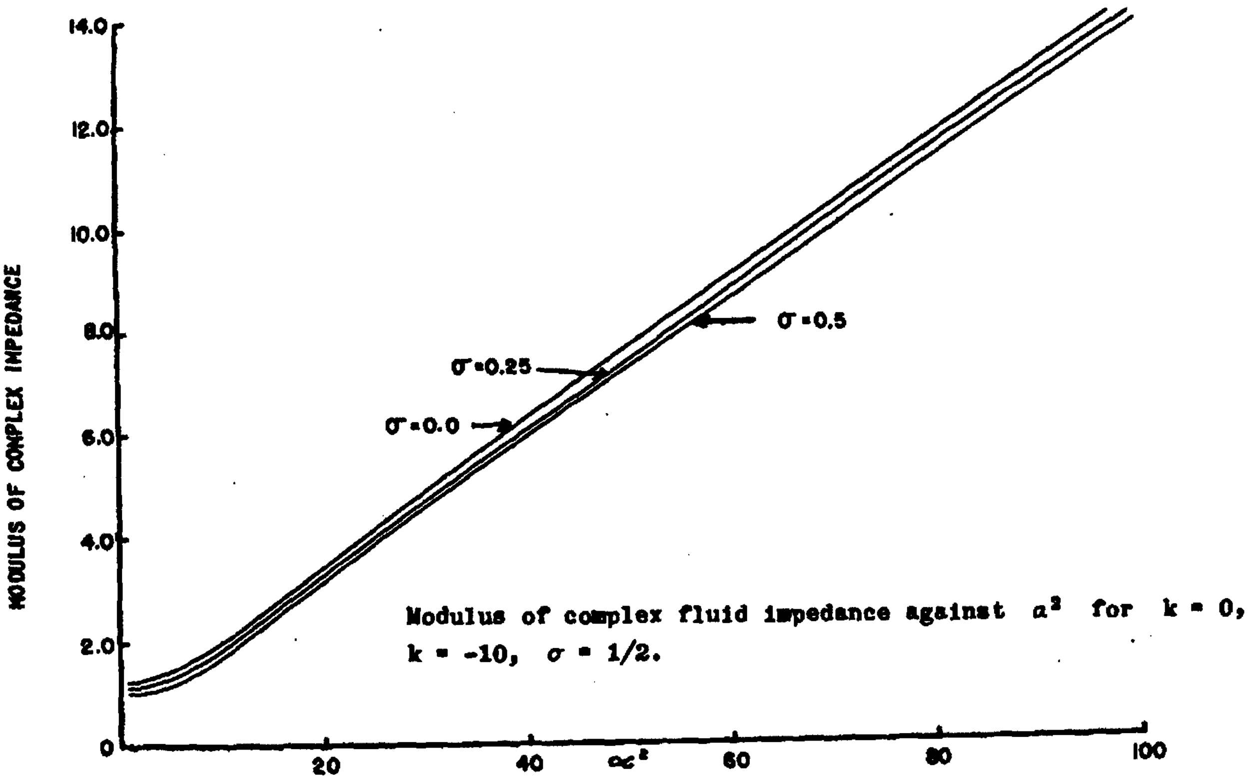

14.0
12.0
10.0
8.0
6.0
4.0
2.0
0
20
40
60
80
100
MODULUS OF COMPLEX IMPEDANCE
σ=0.5
σ=0.25
σ=0.0
Modulus of complex fluid impedance against α^2 for k = 0, k = -10, σ = 1/2.
α^2

FIG. 16

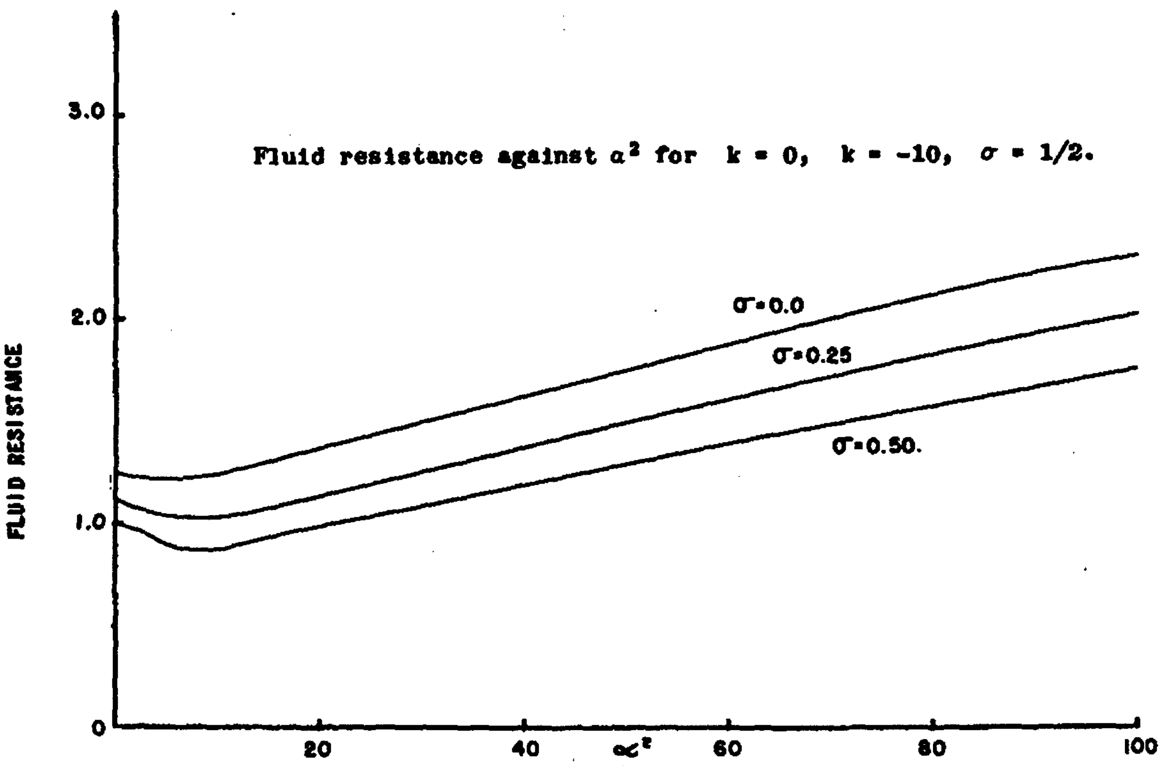

3.0
2.0
1.0
0
20
40
60
80
100
FLUID RESISTANCE
Fluid resistance against α^2 for k = 0, k = -10, σ = 1/2.
σ=0.0
σ=0.25
σ=0.50.
α^2

FIG. 17

Table #6

	$\sigma=\frac{1}{2}$		$\sigma=0$	
α	Amplitude ratio	Phase-difference	Amplitude ratio	Phase-difference
3.34	0.122	74.0°	0.527	26.2°
4.72	0.166	52.9°	0.226	16.2°
5.78	0.190	38.0°	0.145	12.6°
6.67	0.257	28.6°	0.104	10.5°

It is also of interest to calculate the longitudinal velocity at the wall. This is

$$\frac{A_1}{\rho_0 c}(1+\eta)e^{int} \qquad \ldots 6.7.$$

so that its ratio to the average velocity is $(1+\eta)/(1+\eta F_{10})$. If the modulus and phase of this are calculated, they will demonstrate the ratio of the magnitude of the velocity at the wall to that of the average velocity, and the phase-difference between the two. Table 6 shows these quantities, for $\sigma = \frac{1}{2}$, and $\sigma = 0$ $F = 0.1$ for the values, of α for the first four harmonics of the pulse in the dog's femoral artery.

These figures emphasize the critical role of Poisson's Ratio in determining the details of the motion. The phase-differences in the above table are shown with their correct sign in relation to the amplitude ratio, and therefore show that the velocity at the wall 'leads' the average velocity across the tube. The most striking point about this effect is its magnitude, which is greater than might be expected.

If 6.7 is integrated with respect to the time, it will give the longitudinal distance traversed by a point on the wall. This will be

$$\frac{A_1}{in\rho}(1+\eta)e^{int}$$

and if expressed in terms of the pressure gradient it will be

$$-\frac{A_1'}{n^2\rho}(1+\eta)e^{int} \qquad \ldots 6.8.$$

The Fourier - Series for the pressure gradient in McDonald's experiment was taken, and the movement of the wall calculated, assuming $K=0.1$, $\sigma=\frac{1}{2}$. The maximum value of ζ during the cycle was 3.92 mm, which is greater than the diameter of the artery. It is reasonable to suppose that a longitudinal excursion of this magnitude would have been remarked upon, had it ever been observed. The above calculation may seem unrealistic, since it is known the artery is not, in practice, completely free, but it does show that the elastic constraint is not likely to be in resonance with the pulse frequency.

From the point of view of the physical principles involved, the motion of the liquid is most directly appreciated in terms of the dependence of flow on the pressure gradient, which may aptly be regarded as the driving force of the motion. It is also desirable that direct measurements of pressure-gradient be made at the same time as flow measurements, since in comparing the theory with experiment, the pulse-velocity is eliminated from the formula connecting the two, and the complication of the variation of pulse-velocity with frequency does not arise. Some recent results obtained by Spencer, (1956), in which both pressure-gradient and pressure were measured, are considered in Section XI. However, as has already been noted, if the pressure gradient is created by a travelling wave, there is a simple relationship between the pressure gradient and the pressure itself. From 6.5 above,

$$\bar{w}_1 = \frac{p}{\rho_0 c} M_{10}'' e^{i\epsilon_{10}''} \cdot e^{int} \qquad \ldots 6.9.$$

in which c is complex. Since $\frac{c_0}{c} = X - iY$,

$$\bar{w} = \frac{p}{\rho_0 c_0}(X - iY). \quad M_{10}'' e^{i\epsilon_{10}''} \cdot e^{int} \qquad \ldots 6.10.$$

so that the effect of the damping of the wave in transmission is to reduce the phase-advance of flow over pressure. In the limiting condition of stiff

constraint,

$$\bar{w} = \frac{p}{\rho_o c_o} \frac{\sqrt{3M'_{10}}}{2} \cdot e^{i\varepsilon'_{10}/2} \cdot e^{int} \qquad \ldots 6.11$$

so that in these circumstances the maximum phase-lead of flow over pressure will be 45^o. The value of c_o is not directly measurable. Measurement of the pulse-velocity over a short length of artery one would expect to give $c_1 = c_o/X$. In terms of measured pulse-velocity these two formulae become

$$\bar{w} = \frac{p}{\rho_o c_1} (1 - \frac{iY}{X}) M''_{10} e^{\,i\varepsilon''_{10}} \cdot e^{int} \qquad \ldots 6.12.$$

and

$$\bar{w} = \frac{p}{\rho_o c_1} \left(\cos \frac{\varepsilon'_{10}}{2}\right) \cdot \frac{\sqrt{3M'_{10}}}{2} \cdot e^{\frac{1}{2}i\varepsilon''_{10}} \cdot e^{int} \qquad \ldots 6.13.$$

In considering how these formulae might be tested experimentally, it would seem that the best method would be, having available Fourier Analyses of all three quantities, pressure, pressure-gradient, and flow, to abandon all preconceived ideas of what the internal radius of the artery or the viscosity of the blood, might be, and determine the value of α that gives the best fit between pressure-gradient and flow. This can be done without introducing the pulse-velocity.

It might then be supposed that, taking the same value of α, the fit of 6.11. to the observed flow curve could be tested, with the same value of c_o for all harmonics. It must be remembered, however, that in equations 6.5 - 6.13 the primary assumption has been made that $p = A_1 e^{in(t - z/c)}$ i.e. that there is no reflected wave. This assumption is almost certainly not here, except, possibly, at one or two exceptional places. If a reflected wave is included in the expression for the pressure, then

$$p = A_1 e^{in(t - z/c)} + A_2 e^{in(t + z/c)} \qquad \ldots 6.14.$$

and

$$-\frac{\partial p}{\partial z} = \frac{in}{c} \left\{ A_1 e^{in(t - z/c)} - A_2 e^{in(t + z/c)} \right\} \qquad \ldots 6.15.$$

so that 6.9 now becomes

$$\bar{w} = \frac{p}{\rho_o c_o} \cdot \frac{A_1 - A_2}{A_1 + A_2} \sqrt{\frac{3M'_{10}}{2}} \cdot e^{i\varepsilon'_{10}/2} \cdot e^{int} \qquad \ldots 6.16.$$

An attempt to fit 6.9 to a set of observations containing a reflected wave would therefore require an "apparent" velocity

$$c'_o = c_o \cdot \frac{A_1 + A_2}{A_1 - A_2} \qquad \ldots 6.17.$$

whose ratio to the true velocity would depend on the amplitude and phase of the reflected wave. It would seem therefore, that the best use to be made of an analysis of simultaneous recordings of pressure and pressure gradient would be to give information about any reflected wave that may be present, the theory being assumed to be correct. To test the theory itself, some means would have to be found of suppressing the reflected wave. One method might be to apply a matching terminal impedance at the next junction on the distal side of the point of measurement.

Another experimental test of the theory can be devised which is free from this difficulty, using the relationship between pressure and radial expansion. First, for the simpler condition when there is no reflected wave, from 3.26

$$inD_1 = \frac{1}{2} \frac{inR}{c} \bar{w} \qquad \ldots 6.18.$$

and therefore

$$\frac{2\xi}{R} = \bar{w}/c \qquad \ldots 6.19.$$

for each harmonic. This is a remarkably simple relationship between expansion and flow. It can be deduced directly from the equation of continuity

$$\frac{1}{r} \frac{\partial}{\partial r}(ru) + \frac{\partial w}{\partial z} = 0$$

writing $y = \frac{r}{R}$ and integrating from $y = 0$ to $y = 1$,

$$\left[u\right]_{y=1} = \frac{R}{2} \int_0^1 \left(-\frac{\partial w}{\partial z}\right) \cdot 2y\,dy \qquad \ldots 6.20.$$

i.e.

$$\frac{\partial \xi}{\partial t} = -\frac{R}{2} \frac{\partial}{\partial z} \bar{w} \qquad \ldots 6.21.$$

Since

$$\frac{\partial \bar{w}}{\partial z} = -\frac{1}{c}\frac{\partial w}{\partial t},$$

integrating 6.21 with respect to the time gives

$$\frac{2\xi}{R} = \frac{\bar{w}}{c}$$

If the expression for the pressure contains a reflected wave, i.e., if

$$p = A_1 e^{in(t-z/c)} + A_2 e^{in(t+z/c)}$$

then

$$\bar{w} = \frac{A_1}{\rho_o c} e^{in(t-z/c)} - \frac{A_2}{\rho_o c} e^{in(t+z/c)} \quad M''_{10} e^{i\epsilon''_{10}} \cdot$$

and therefore

$$\frac{\partial \bar{w}}{\partial z} = \frac{in}{\rho_o c_o^2} M''_{10} e^{i\epsilon''_{10}} \left\{ A_1 e^{in(t-z/c)} + A_2 e^{in(t+z/c)} \right\}$$

so that

$$\frac{2\xi}{R} = \frac{p}{\rho_o c^2} M''_{10} e^{i\epsilon''_{10}} \qquad \ldots 6.22.$$

or

$$\frac{2\xi}{R} = \frac{p}{\rho_o c_o^2} \left(\frac{c_o}{c}\right)^2 M''_{10} e^{i\epsilon''_{10}} \qquad \ldots 6.23.$$

which may be written

$$\frac{2\xi}{R} = \frac{p}{\rho_o c_o^2} (1-\alpha^2) \frac{x}{2} (1+\eta F_{10}) \qquad \ldots 6.24.$$

and the form of this is the same whether a reflected wave is present or not. For all finite values of k, the phase of the complex quantity $\frac{1}{2}x(1+\eta F_{10})$ is positive, so that variation in diameter always leads pressure, though never by more than a few degrees, as is shown in Fig. 19, which is a plot of ph $\left\{(1-\alpha^2)\frac{x}{2}(1+\eta F_{10})\right\}$ against α for k=0, $\alpha=\frac{1}{2}$.

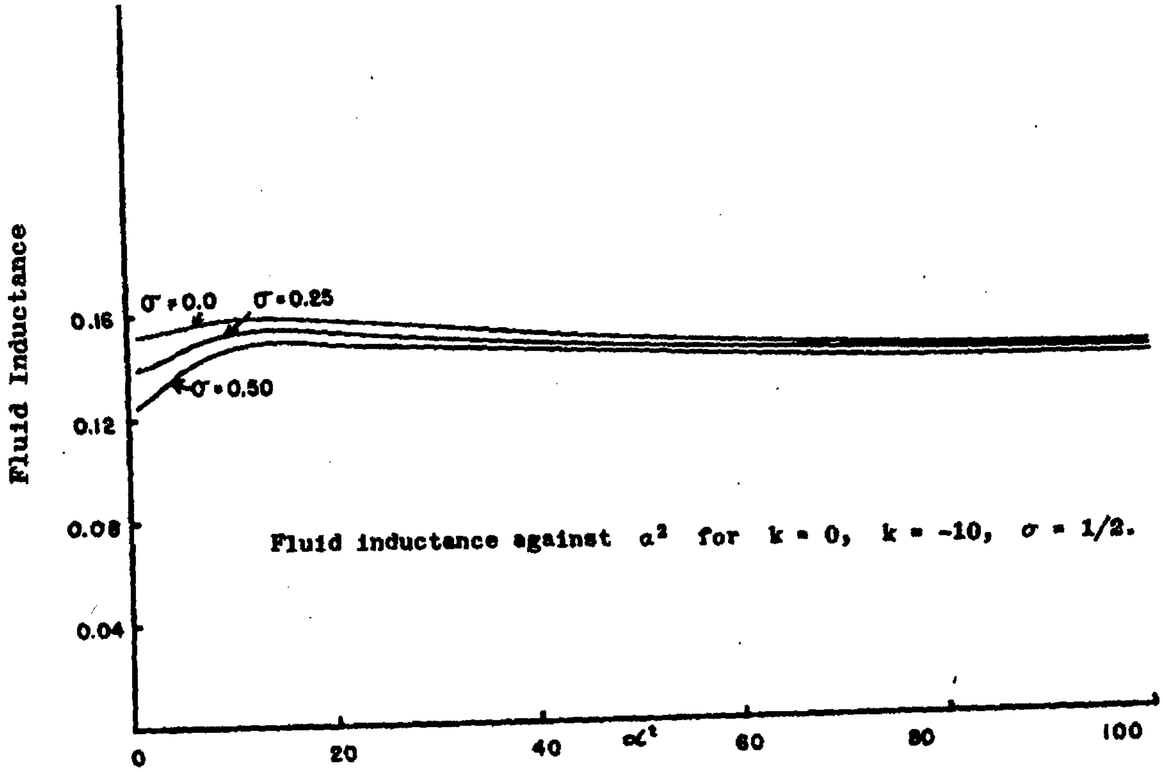

Fluid Inductance
0.16
0.12
0.08
0.04
σ = 0.0
σ = 0.25
σ = 0.50
Fluid inductance against α² for k = 0, k = -10, σ = 1/2.
0
20
40
α²
60
80
100

FIG. 18

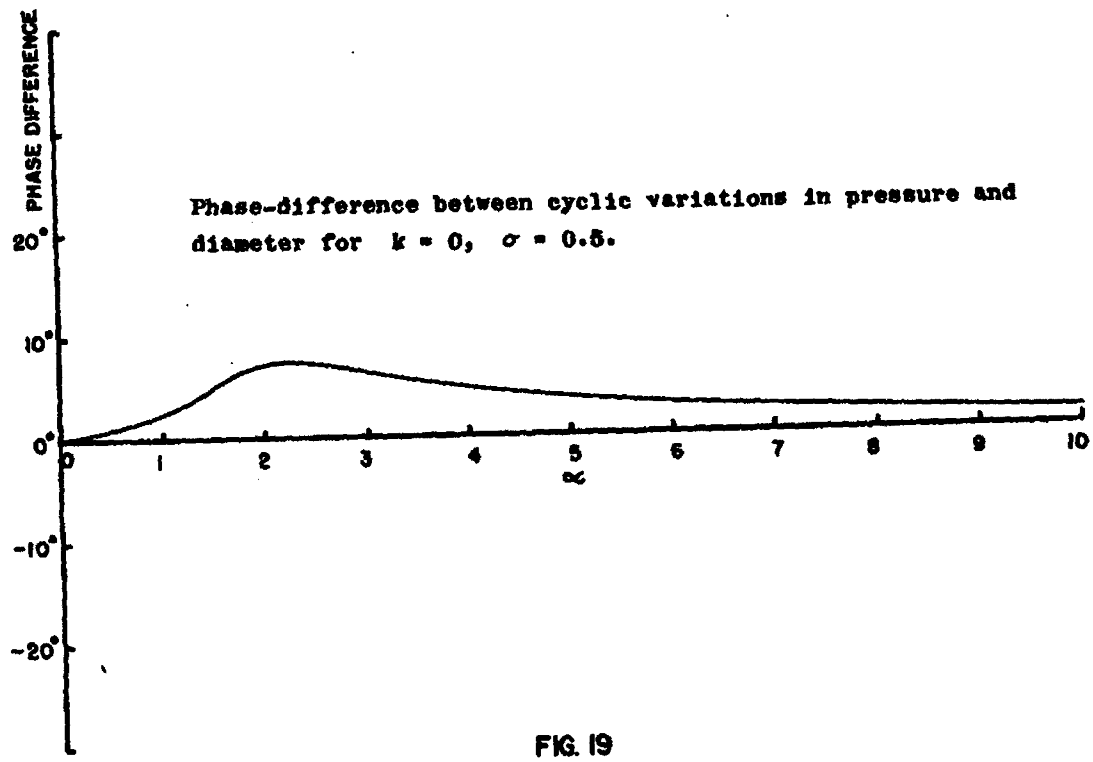

PHASE DIFFERENCE
Phase-difference between cyclic variations in pressure and
diameter for k = 0, σ = 0.5.
20°
10°
0°
-10°
-20°
0
1
2
3
4
5
6
7
8
9
10
α

FIG. 19

In the limiting condition of heavy loading and stiff constraint, $(k \to \infty)$ 6.15 reduces to the very simple form:

$$\frac{2\xi}{R} = (1-\sigma^2) \cdot \frac{p}{\rho_o c_o^2} \qquad \ldots 6.25.$$

and therefore the pressure and expansion will be in phase at all frequencies. In view of the fact that for other conditions of constraint the phase difference is always small, this equation does not provide a critical means of distinguishing between them. It does, however, provide a test of the presence of internal damping in the wall of the tube.

The formula

$$\frac{2\xi}{R} = \frac{p}{\rho_o c_o^2} \cdot \frac{c_o^2}{c^2} \cdot M''_{10} e^{i\varepsilon''_{10}}$$

becomes, on inserting the value of c_o/c from 3.14,

$$\frac{2\xi}{R} = \frac{p}{\rho_o c_o^2} \cdot \frac{3}{4} \cdot \left\{1-in\left(\Delta E+\frac{2}{3}\Delta\sigma\right)\right\} \qquad \ldots 6.26.$$

so that if radial expansion lags behind pressure, internal damping must be present, and if it is of the simple nature assumed above, the amount of phase-lag in any harmonic will be roughly proportional to the frequency. If the phase-lag is large, 6.17 will not be sufficiently accurate, and the exact form

$$\frac{2\xi}{R} = \frac{p}{\rho_o c_o^2} \cdot \frac{3}{4} \cdot \left\{\frac{1+\frac{4}{3}(n\Delta\sigma)-i^2/_3 n\Delta\sigma}{1+in\,\Delta E}\right\} \qquad \ldots 6.27.$$

must be used. The phase-lag is, therefore,

$$\tan^{-1} n\Delta E + \tan^{-1}\frac{2n\Delta\sigma}{3+4(n\Delta\sigma)^2} \qquad \ldots 6.28.$$

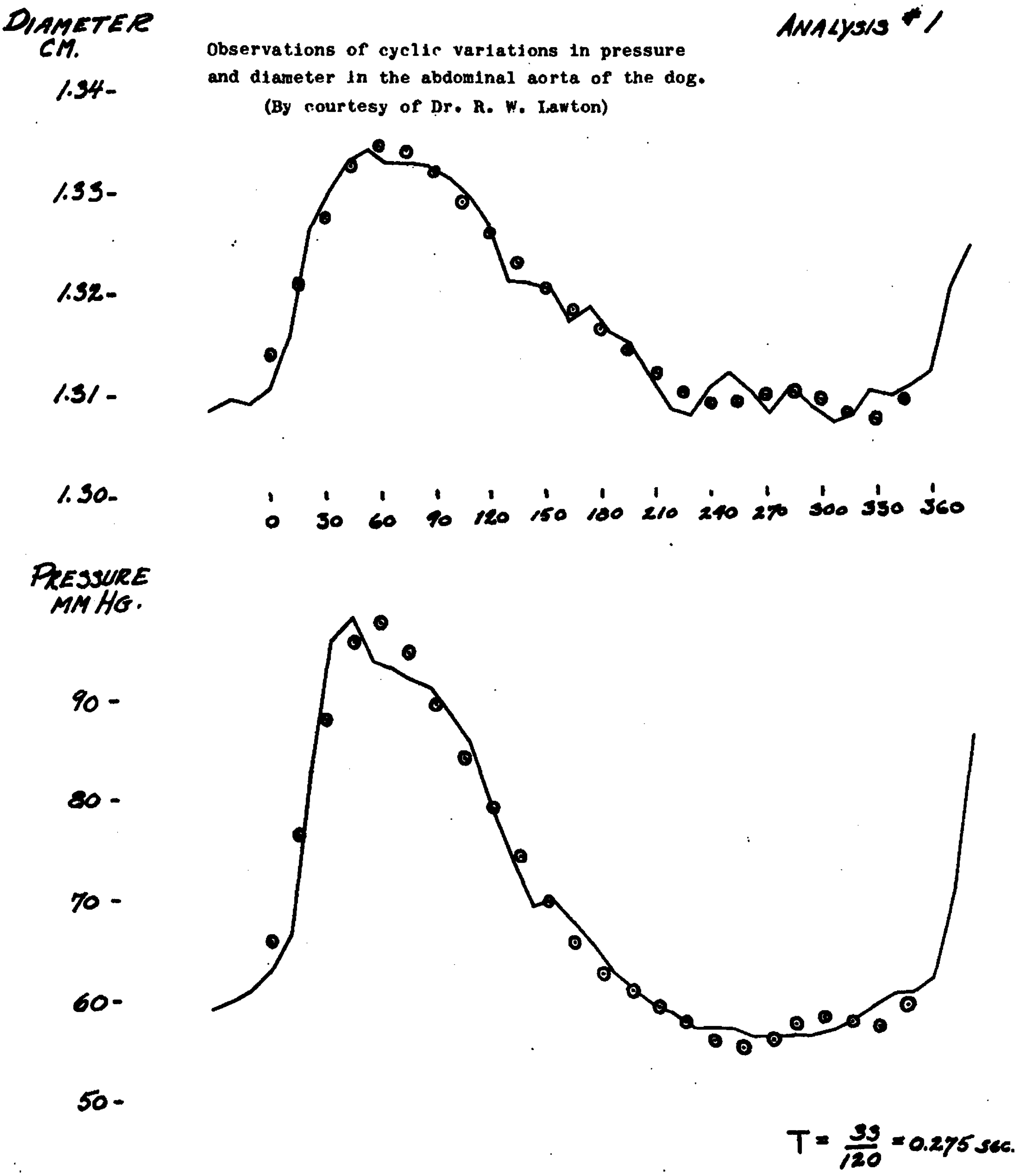
and from this estimates of ΔE and $\Delta\sigma$ could be obtained by combining the results from several harmonics.

Lawton (1955) has succeeded in obtaining measurements of variation in diameter throughout the pulse-cycle by filming the motion of very small beads sewn to the abdominal aorta of the dog. Two typical results, together with the corresponding variation in pressure, are shown in Figs. 20 and 21. The results of Fourier Analysis up to the fourth harmonic are shown in Table 4. They are given in modulus and phase form, i.e. in the form $M_m \cos(mnt-\varphi_m)$, m being the order

of the harmonic. These results show no steady increase in phase-lag with frequency. Those of curve #1 seem to show an opposite effect. This may be illusory. The fourth harmonic is small in amplitude, and this estimate of phase-lag cannot be expected to be very accurate. It seems reasonable, therefore, to conclude from these results that, although there are irregular variations in phase between pressure and diameter, these are not inconsistent with the assumption that there is no damping in the wall, and therefore the simple theory is adequate. Finer distinctions will have little meaning until more accurate measurements can be made.

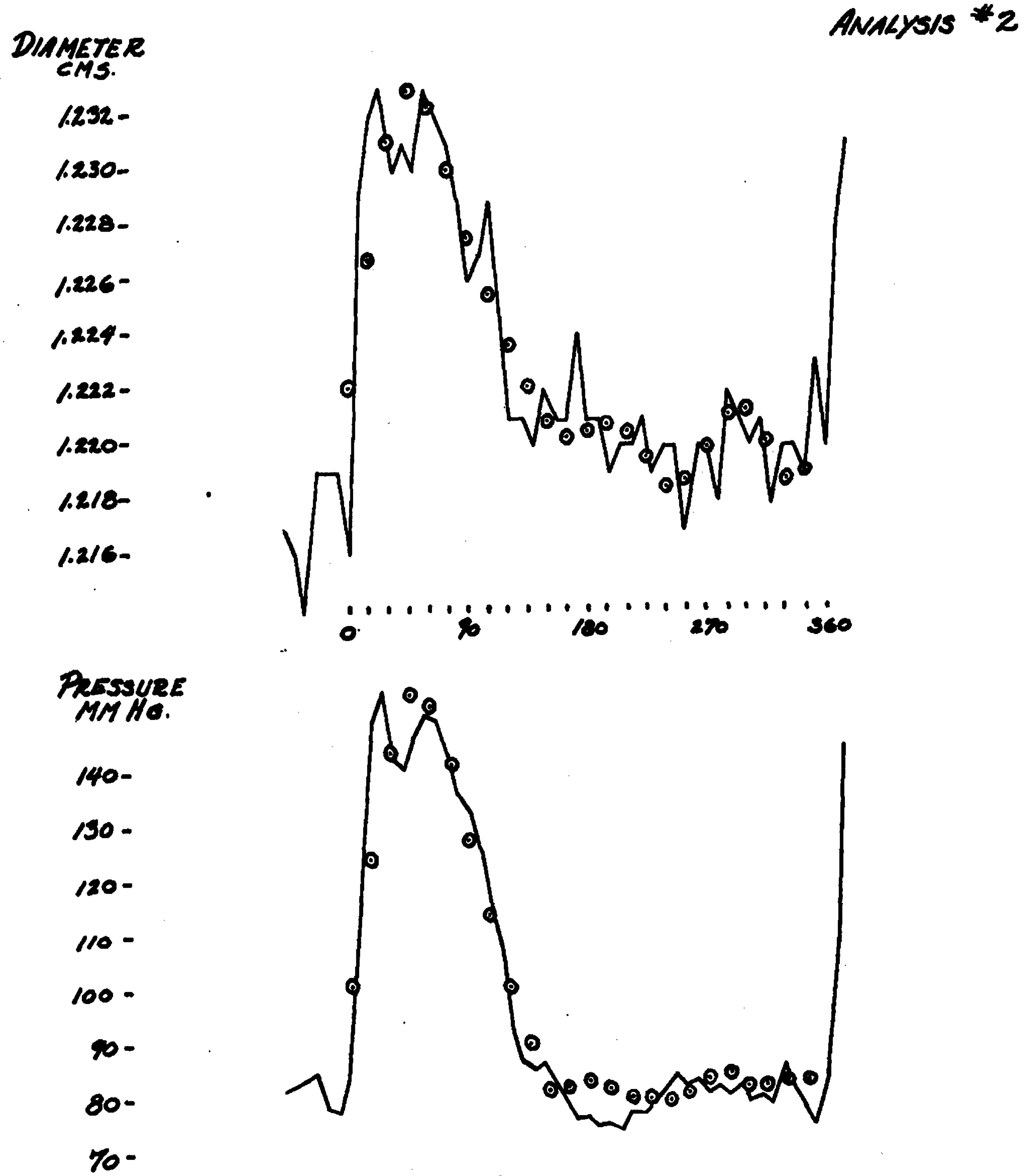
TABLE 7

Harmonic	Pressure		Diameter		Phase-lag
	M_m	φ_m^o	$M_m x 10^{-3}$	φ_m	
Curve #1					
1	18.74	75.67	12.17	86.31	10.6
2	6.80	128.67	4.05	133.55	4.9
3	3.14	154.45	2.14	149.68	-4.8
4	1.56	156.75	0.50	110.03	-46.5
Constant Term	69.73		1.31823		
Curve #2					Phase-lag
1		62.35		56.85	5.5°
2		116.50		117.05	-0.5°
3		152.85		136.98	15.87
4		124.50		122.60	1.9



Observations of cyclic variations in pressure and diameter in the abdominal aorta of the dog.
(By courtesy of Dr. R. W. Lawton)

Fig. 20



Observations of cyclic variations in pressure and diameter in the abdominal aorta of the dog. (By courtesy of Dr. R. W. Lawton).

T = 0.352 sec.

Fig. 21

SECTION VII

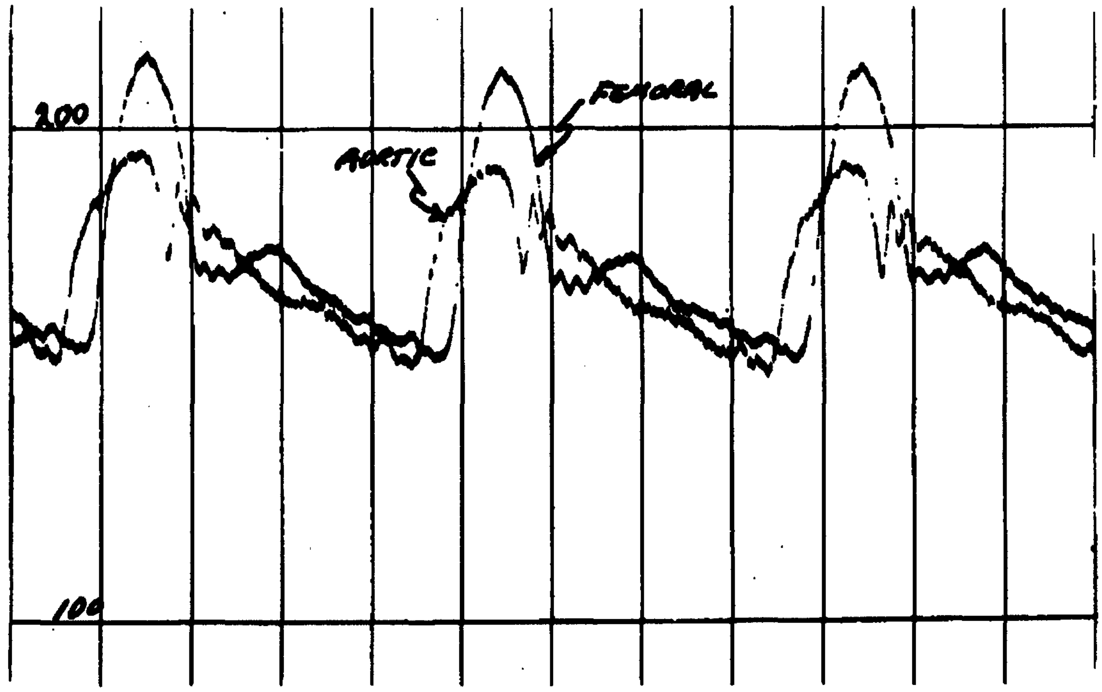
THE CALCULATION OF REFLECTION - COEFFICIENTS AT JUNCTIONS AND DISCONTINUITIES

One of the obstacles to the acceptance of the theory developed in the preceding pages is the amount of damping of the pulse wave predicted by it. Far from diminishing, the peak of the pulse-pressure rises in transmission, as may be seen from Fig. 22 which shows simultaneous recordings of the aortic and femoral pulse. A state of affairs in which the theory predicts a $5^0/_0$ - $10^0/_0$ reduction in the amplitude of the main harmonics for each 10cm. of travel is at first sight hard to reconcile with the observed rise in peak pressure, or even with the simple clinical observation that the human pulse can be felt in the foot.

A reconciliation of this apparent contradiction may very well be found in the study of changes in phase and amplitude of the harmonic terms at changes in arterial dimensions, and at junctions in the arterial system. Many observations have been made in the past of the form of the pulse-pressure on both the proximal and distal sides of important branching-points, but these cannot be used as a rigorous test of the theory unless they are accompanied by measurements of pulse-velocity over short distances on both sides of the junction, and by measurements of the in ternal diameters of the arteries. Detailed calculations are made below for some simple discontinuities and for a bifurcation into two equal branches, a few sets of conditions being chosen out of the many possibilities. An attempt is also made at a rough calculation of the reflection-coefficients at the celiac and iliac junctions in the dog. The method used is the simple one given in Lord Rayleigh's "Theory of Sound." In this method no attempt is made to study the details of the motion of the liquid at the junction. Two equations are written down, expressing the conditions of continuity of pressure and rate of flow across the junction, and these are solved to give the reflection and transmission coefficients.

Some calculations of reflection coefficients using this method were made by Karreman (1952), 1953, 1954) for sudden changes in arterial dimensions and for a division of an artery into two branches. Unfortunately, Karreman took no account of the viscosity of the liquid in the equation for continuity of flow, so that his results will only be true for very large α. Instead of the correct formula for the pressure-flow relation

$$\bar{w} = \frac{A}{\rho_0 c} M''_{10} \cdot e^{in(t-z/c)} \cdot e^{i\varepsilon''_{10}} \qquad \ldots 7.1.$$



Aortic and femoral pulse in the dog.
(By courtesy of Dr. R. W. Stacy)

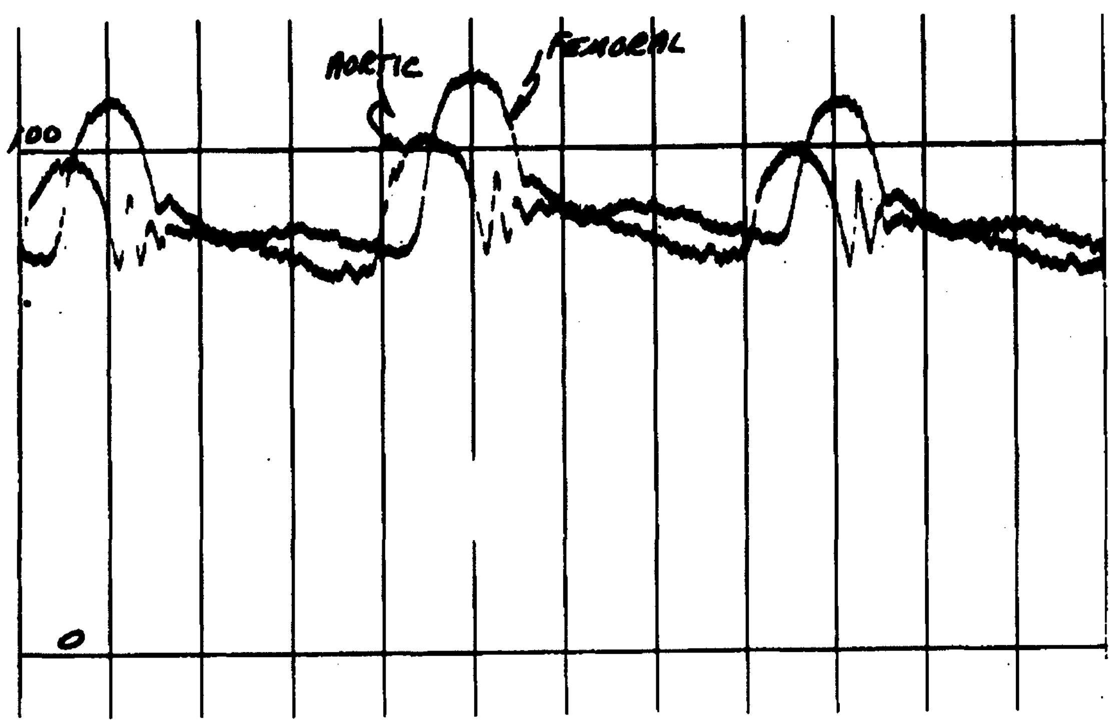


Fig. 22

he used $\bar{w} = A/\rho_0 c$ i.e. in all his calculations he assumed $M''_{10}=1$, $\varepsilon''_{10}=0$. As an example of the kind of error that can arise from the use of this approximation, consider a sudden reduction in the size of an artery from radius R to radius r. Let the value of α in the larger tube be α_1, and that in the smaller tube be α_2. Then $\alpha_2<\alpha_1$, since $\alpha_2/\alpha_1 = r/R$. Let the incident pressure-wave be

$$A_1 e^{in(t-z/c_1)}$$

and the reflected wave be

$$A_4 e^{in(t+z/c_1)}$$

the transmitted wave in the smaller tube being

$$A_2 e^{in(t-z/c_2)}$$

where c_1 is the wave-velocity in the larger tube, c_2 that in the smaller. For continuity of pressure across the discontinuity,

$$A_1+A_4=A_2 \qquad \ldots 7.2.$$

If we use the formula for flow in the constrained tube, the equation for continuity of flow will be

$$\pi R^2 \cdot \frac{A_1-A_4}{\rho_0 c_0} \left\{M'_{10}(\alpha_1)\right\}^{1/2} e^{\frac{i\varepsilon'_{10}(\alpha_1)}{2}}$$

$$= \pi r^2 \cdot \frac{A_2}{\rho_0 c'_0} \left\{M'_{10}(\alpha_2)\right\}^{1/2} \cdot e^{\frac{i\varepsilon'_{10}(\alpha_2)}{2}} \qquad \ldots 7.3.$$

in which c_0, c'_0 are the limiting velocities in the two tubes for $\alpha \to \infty$. Retaining Karreman's assumption that these are inversely proportional to the square-root of the radius, (Karreman quotes this as being correct for an elastomeric tube) i.e. assuming that the mass-loading on the two tubes is the same, this equation becomes

$$\frac{A_1-A_4}{A_2} = \left(\frac{r}{R}\right)^{2.5} \cdot \left\{\frac{M'_{10}(\alpha_2)}{M'_{10}(\alpha_1)}\right\}^{1/2} e^{\frac{1}{2}i\left\{\varepsilon'_{10}(\alpha_2) - \varepsilon'_{10}(\alpha_1)\right\}} \qquad \ldots 7.4.$$

and if we write λ for the right-hand side of this equation,

$$\frac{A_4}{A_1} = \frac{1-\lambda}{1+\lambda} \qquad \ldots 7.5.$$

for the reflection-coefficient. The modulus of this complex quantity will be the amplitude ratio,its phase will be the phase-change on reflection. Karreman's formula for the reflection coefficient has

$$\lambda = \left(\frac{r}{R}\right)^{2.5}.$$

we may therefore regard the factor

$$\left\{\frac{M'_{10}(\alpha_2)}{M'_{10}(\alpha_1)}\right\}^{\frac{1}{2}} e^{\frac{1}{2}i\left\{\varepsilon'_{10}(\alpha_2) - \varepsilon'_{10}(\alpha_1)\right\}} \qquad \ldots 7.6.$$

as a "throttling" effect due to viscosity. It will be clear from this that for Karreman's formula to be even approximately correct, both α_2 and α_1 must be very large, and when studying the problem of reflection at a coarctation, (one of the main purposes of Karreman's work) this can be very far from the truth.

The same formula can be used for a division of an artery into a number of branches of equal size. All that is necessary is to multiply the right-hand side of 10.4 by the number of branches. Thus for a division into two equal branches,

$$\lambda = 2\left(\frac{r}{R}\right)^{2.5} \left\{\frac{M'_{10}(\alpha_2)}{M'_{10}(\alpha_1)}\right\}^{\frac{1}{2}} e^{\frac{1}{2}i\left\{\varepsilon'_{10}(\alpha_2)-\varepsilon'_{10}(\alpha_1)\right\}} \qquad \ldots 7.7.$$

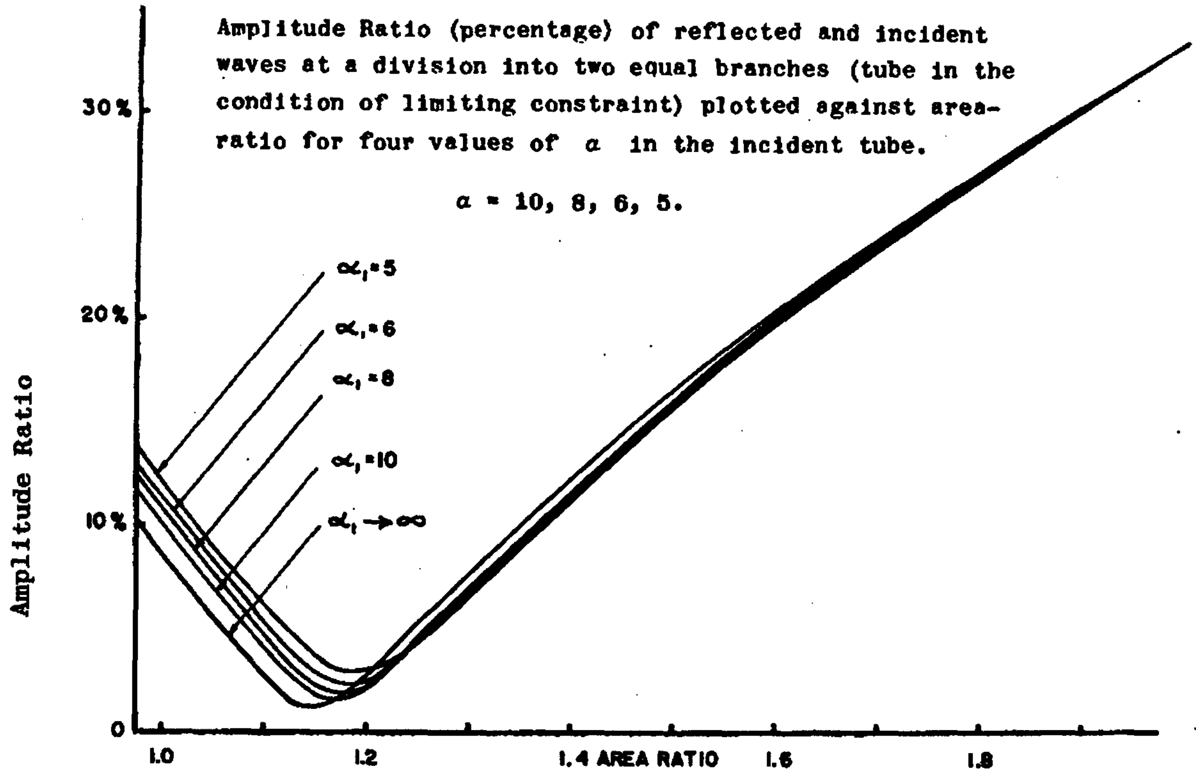
For the unconstrained tube with equal velocities on both sides of the junction,

$$\lambda = 2\left(\frac{r}{R}\right)^{2} \cdot \left\{\frac{M''_{10}(\alpha_2)}{M''_{10}(\alpha_1)}\right\} e^{i\left\{\varepsilon''_{10}(\alpha_2)-\varepsilon''_{10}(\alpha_1)\right\}} \qquad \ldots 7.8.$$

The quantity $2\left(\frac{r}{R}\right)^2$, which is the ratio of the combined area of the branches to the area of the original tube, will be called the area-ratio of the junction. Numerical values of amplitude ratio and phase-lag have been computed for this division into two equal branches, using both the above formulae.

In Fig. 23 the modulus of the reflection coefficient is plotted against the area ratio, for four values of $\alpha_1$10, 8, 6, 5. with λ as given in 10.7. i.e. for the tube with stiff constraint, and equal mass-loading on the original artery and branches. Fig. 24 gives the corresponding curves for the phase-lag on reflection. Figs. 25 and 26 are a similar set of curves with λ as given by 10.8. i.e. for an unconstrained tube with K=0 and $\sigma = 1/_2$, the wave-velocities in the original tube and the branches being assumed to be equal. In Figs. 27 and 28 the mass-loading on the branches has been increased, the assumption being made that the wave-velocity is inverely proportional to the radius of the tube, i.e.

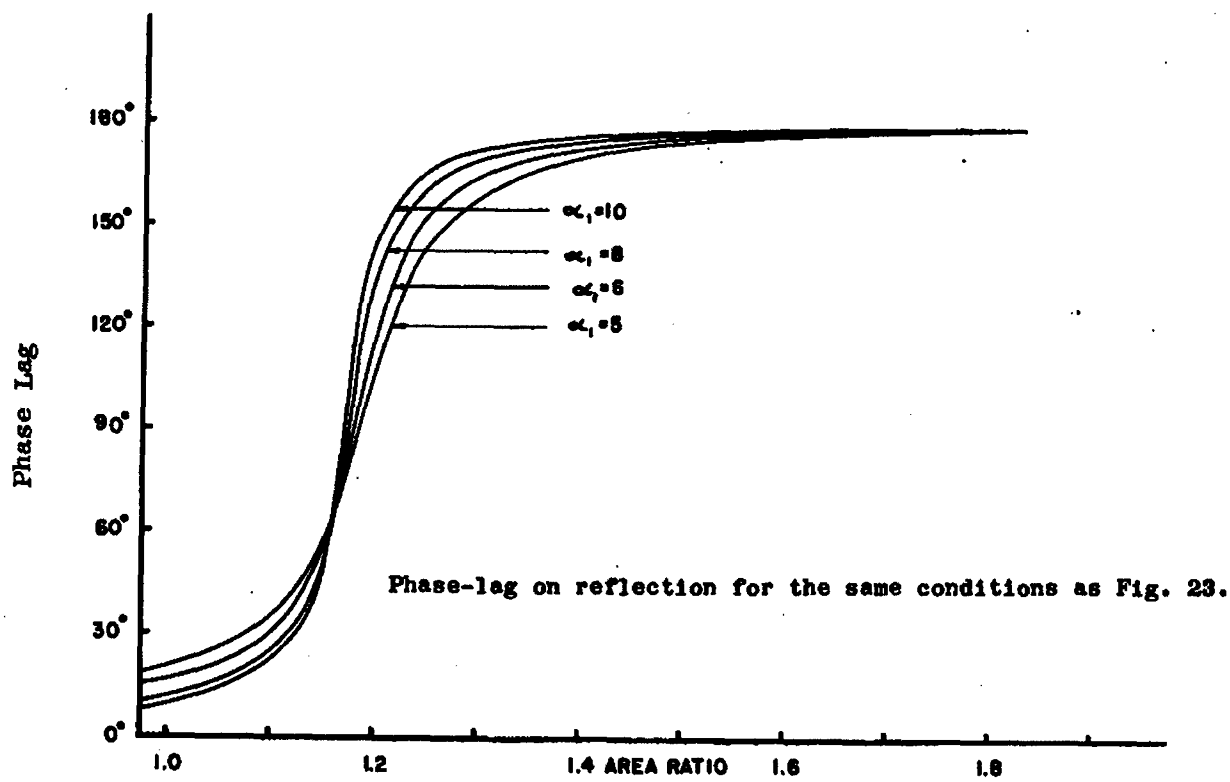
$$\lambda = 2\left(\frac{r}{R}\right)^{3} \left\{\frac{M'_{10}(\alpha_2)}{M'_{10}(\alpha_1)}\right\} \cdot e^{\frac{1}{2}i\left\{\varepsilon'_{10}(\alpha_2)-\varepsilon'_{10}(\alpha_1)\right\}}$$



Amplitude Ratio (percentage) of reflected and incident waves at a division into two equal branches (tube in the condition of limiting constraint) plotted against area-ratio for four values of α in the incident tube.

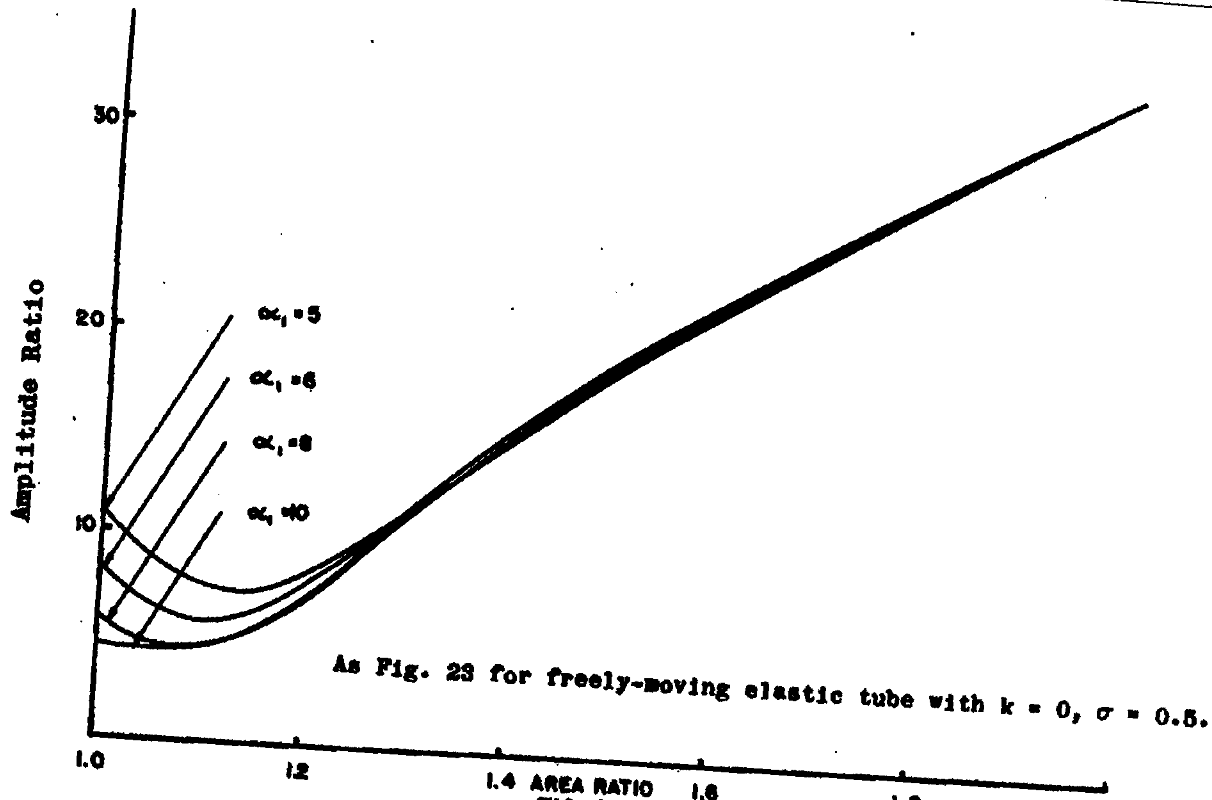
$\alpha = 10, 8, 6, 5.$

FIG. 23



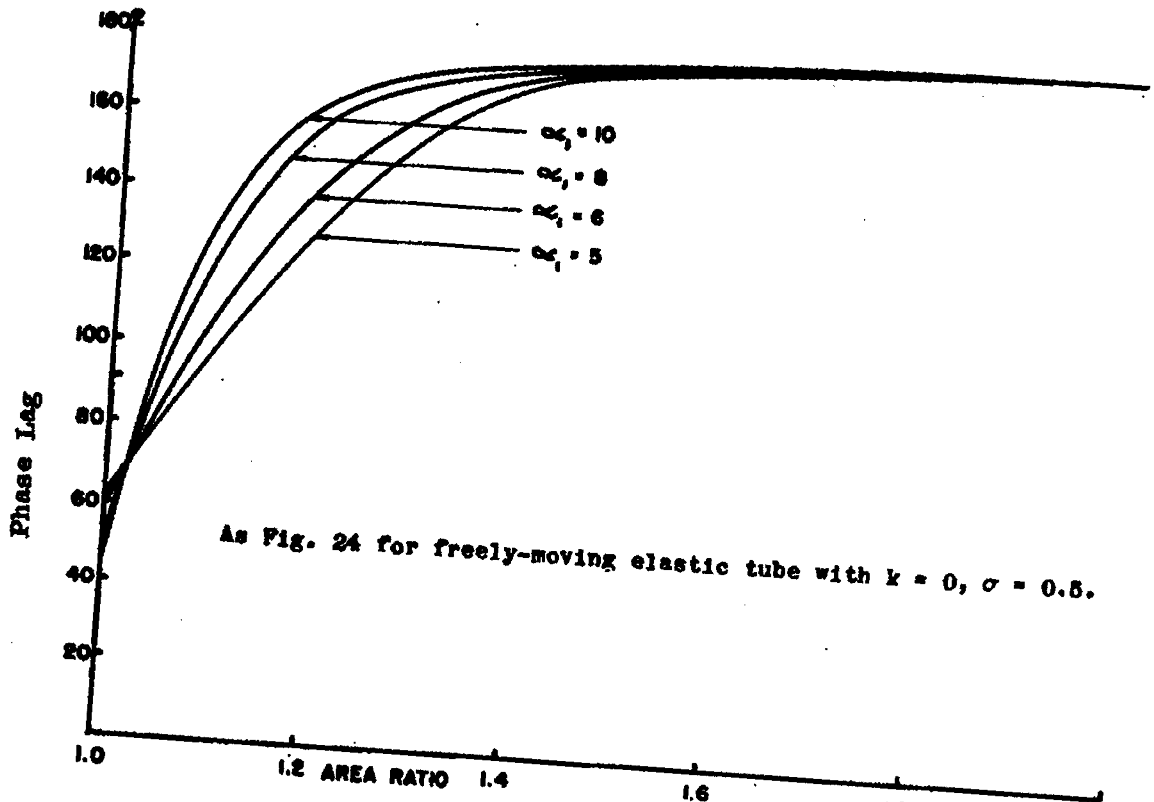
Phase-lag on reflection for the same conditions as Fig. 23.

FIG. 24



As Fig. 23 for freely-moving elastic tube with $k = 0$, $\sigma = 0.5$.

FIG. 25



As Fig. 24 for freely-moving elastic tube with $k = 0$, $\sigma = 0.5$.

FIG. 26

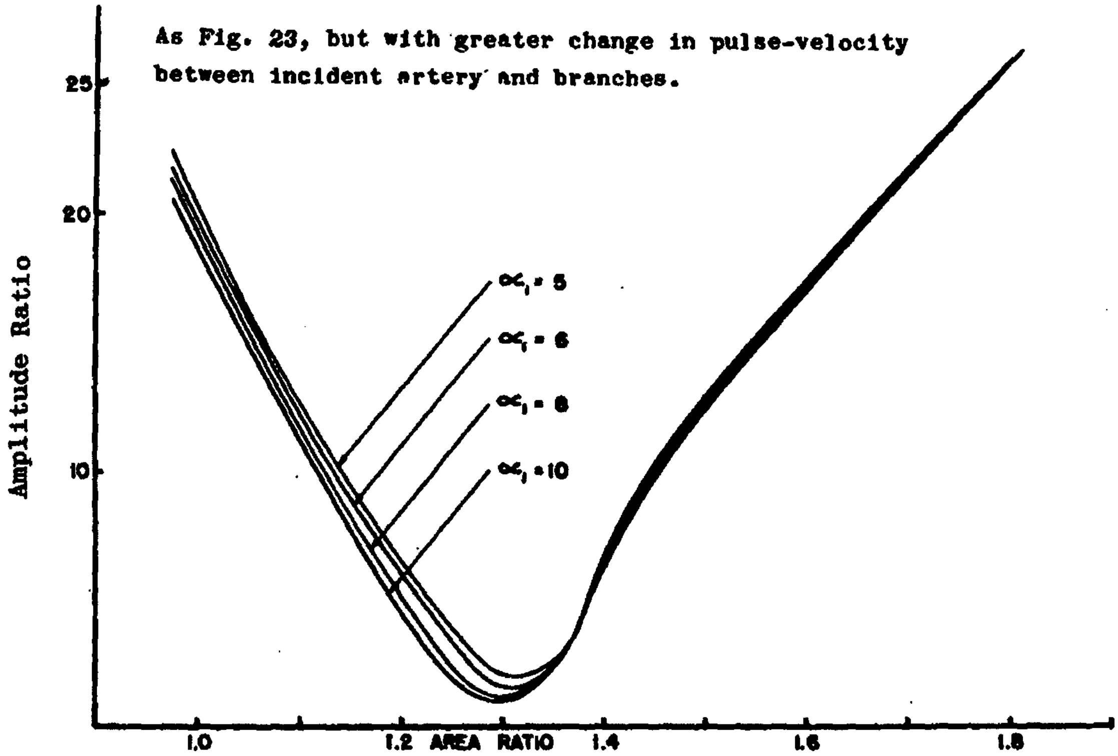

As Fig. 23, but with greater change in pulse-velocity between incident artery and branches.
25
20
10
Amplitude Ratio
$\alpha_1 = 5$
$\alpha_1 = 6$
$\alpha_1 = 8$
$\alpha_1 = 10$
1.0
1.2 AREA RATIO
1.4
1.6
1.8

FIG. 27

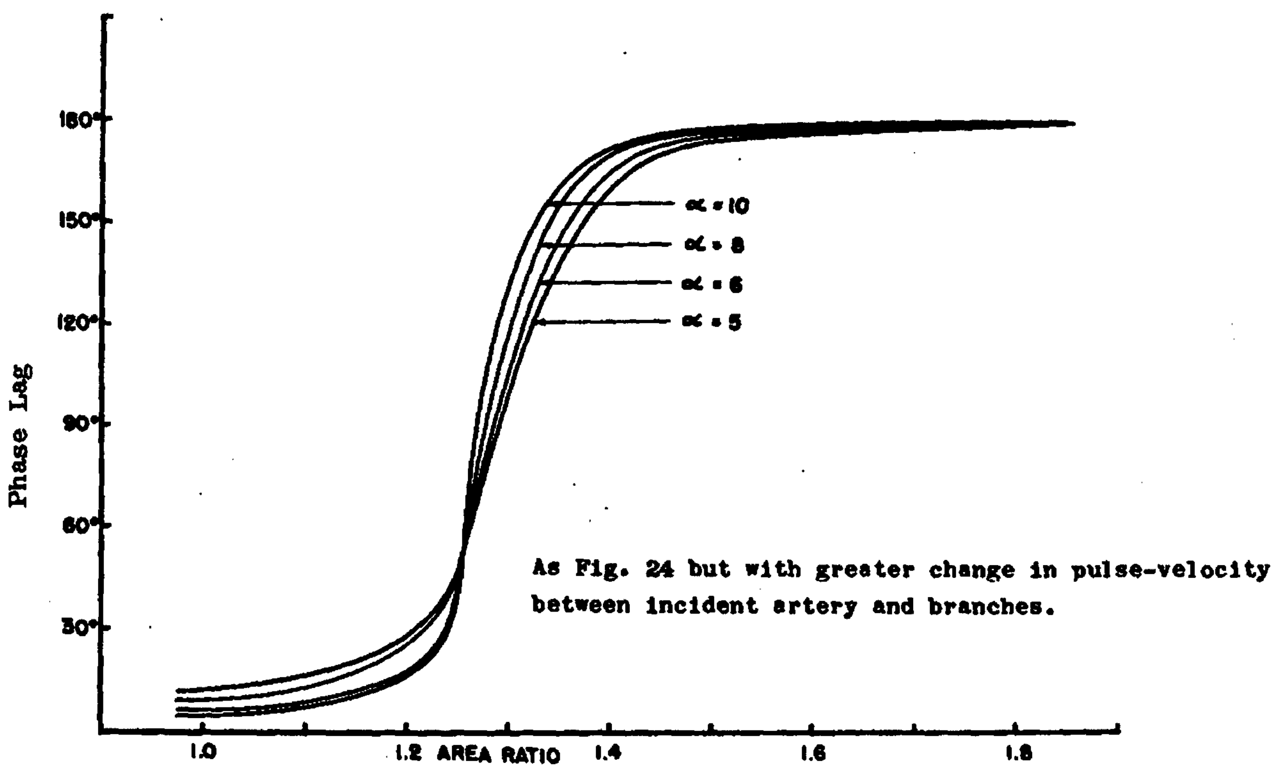

180°
150°
120°
90°
60°
30°
Phase Lag
$\alpha = 10$
$\alpha = 8$
$\alpha = 6$
$\alpha = 5$
As Fig. 24 but with greater change in pulse-velocity between incident artery and branches.
1.0
1.2 AREA RATIO
1.4
1.6
1.8

FIG. 28

When each of the branches is the same size as the original artery, the reflection coefficient is the same for all these conditions, having a modulus of 1/3 and a phase-lag of 180°.

All the curves are similar, showing a minimum at an area-ratio slightly greater than 1.0- this minimum being at a higher value of the area ratio the greater the disparity in velocity between the original artery and the branches. It will also be noticed that as this disparity increases, this minimum is sharper and lower. In Fig. 23 it is always less than 3%, whatever the value of α. Although the minimum is higher for the unconstrained tube, it is less critical.

Some enhancement of the harmonic terms in the pressure is, therefore, to be expected at each reflection, so long as the increase in total area is not too great. If the area-ratio of the junction is greater than about 1·3 or 1·4, the phase-lag will be more than 90°, and this would be expected to cause "spreading" rather than "peaking" of the pulse-wave.

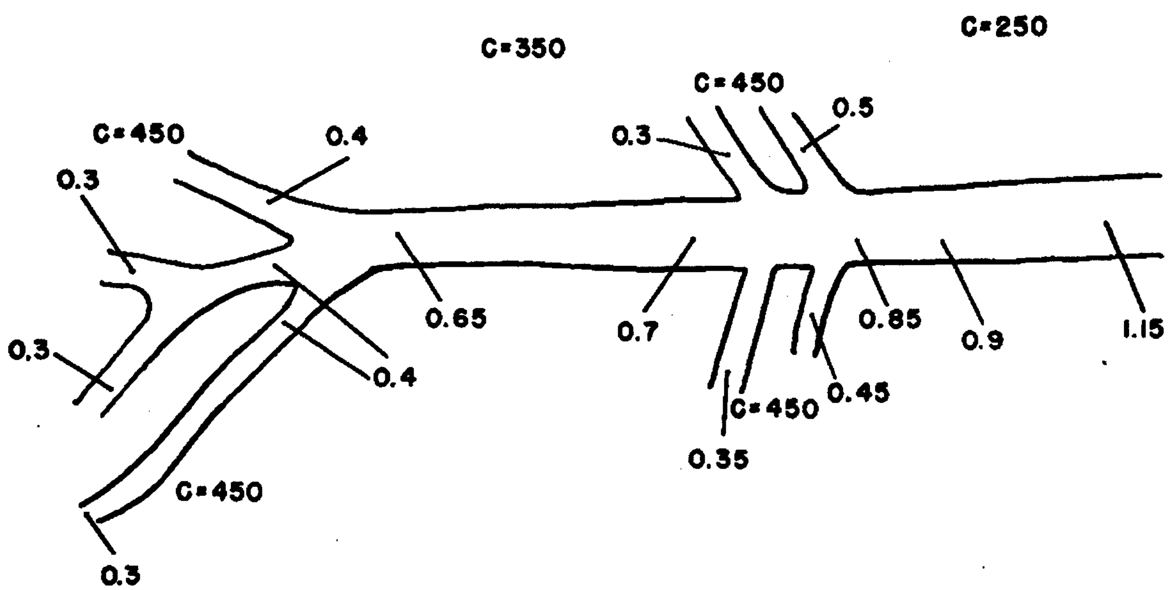


FIG. 29

As an example of the extension of the method to more complex junctions, the celiac and iliac junctions in the dog will be taken. In Fig. 29 is shown a rough diagr diagram of part of the arterial system of the dog, with estimates of diameter of the arteries, in cm. and of the pulse-velocityyin cm/sec. The velocities were not measured in the same animal, but were suggested by Dr. D.A. McDonald, who has made measurements of the pulse-velocity in dogs using the microsecond counter chronometer. (Hale, McDonald, Taylor and Womersley, 1955). In the calculations it is not necessary for these values to be exact, so long as their ratios are reasonably correct. Consider first the celiac junction, shown in Fig. 30. With the same notation as before, i.e., A_1 for the amplitude of the incident wave, A_2 for that of the transmitted wave, and A_4 for that of the reflected wave,

$$\lambda = \frac{A_1-A_4}{A_1+A_4} = \frac{250}{450} \cdot \frac{R_2^2}{R_1^2} \cdot \frac{M''_{10}(\alpha_2)}{M''_{10}(\alpha_1)} \cdot \exp \cdot \text{in} \left\{\varepsilon''_{10}(\alpha_2)-\varepsilon''_{10}(\alpha_1)\right\}$$

$$+ \frac{250}{450} \cdot \frac{R_3^2}{R_1^2} \cdot \frac{M''_{10}(\alpha_3)}{M''_{10}(\alpha_1)} \cdot \exp \cdot \text{in} \left\{\varepsilon''_{10}(\alpha_3)-\varepsilon''_{10}(\alpha_1)\right\}$$

$$+ \frac{2\text{x}250}{450} \cdot \frac{R_4^2}{R_1^2} \cdot \frac{M''_{10}(\alpha_4)}{M''_{10}(\alpha_1)} \cdot \exp \cdot \text{in} \left\{\varepsilon''_{10}(\alpha_4)-\varepsilon''_{10}(\alpha_1)\right\} \qquad \ldots 7.13.$$

$$+ \frac{250}{350} \cdot \frac{R_5^2}{R_1^2} \cdot \frac{M''_{10}(\alpha_5)}{M''_{10}(\alpha_1)} \cdot \exp \cdot \text{in} \left\{\varepsilon''_{10}(\alpha_5)-\varepsilon''_{10}(\alpha_1)\right\}$$

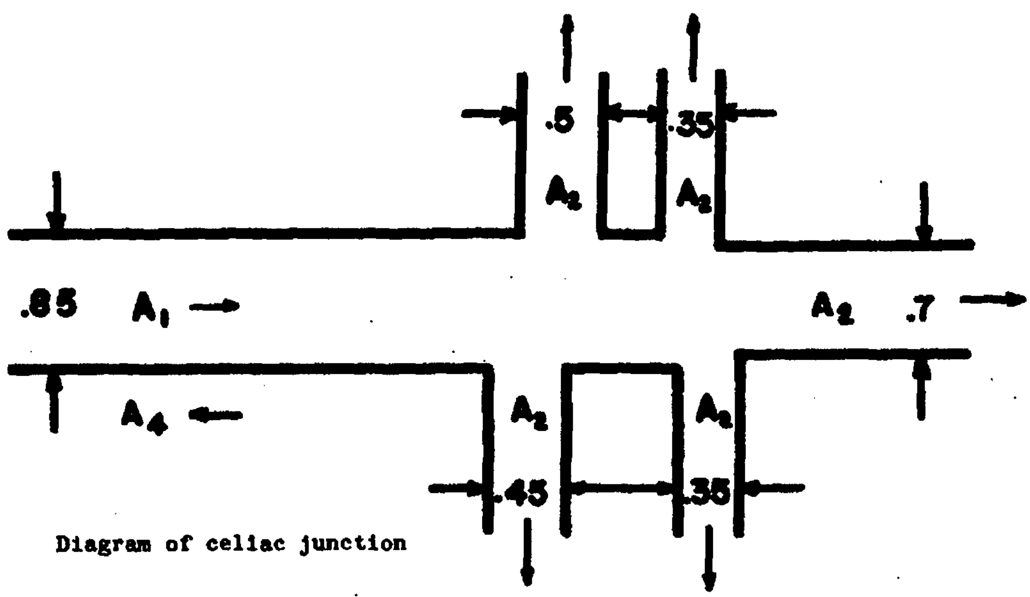


Diagram of celiac junction

Fig. 30

A table for the calculation of λ can be set out as shown below:

Branch	α	M''_{10}	ε''_{10}	$\frac{M''_{10}(\alpha_n)}{M''_{10}(\alpha_1)}$	$\varepsilon''_{10}(\alpha_n)-\varepsilon''_{10}(\alpha_1)$	R_n^2/R_1^2
1	8.5	0.8835	8.56°			
2	4.5	0.7956	18.83	0.9005	10.27°	0.2803
3	5.0	0.8127	16.37	0.9199	7.81°	0.3460
4	3.5	0.7462	27.16	0.8446	18.60°	0.1696
5	7.9	0.8608	10.78	0.9743	2.22°	0.6782

From this table the four separate terms which make up λ can be calculated, first in modulus and phase form, then in real and imaginary parts.

Term	Modulus	Phase		Real		Imaginary
1	0.1402	10.27°		0.1380		0.0250
2	0.1768	7.81°		0.1752		0.0240
3	0.1592	18.60°		0.1509		0.0508
4	0.4729	2.22°		0.4716		0.0183
		λ	=	0.9754	+ ix	0.1181

so that

$$\frac{A_4}{A_1} = \frac{1-\lambda}{1+\lambda} = \frac{0.0243-0.1181i}{1.9757+0.1181i}$$

The amplitude ratio is $\frac{|A_4|}{|A_1|}$ = 0.0690 and the phase-lag is

$$\tan^{-1}\frac{0.1181}{0.0243} + \tan^{-1}\frac{0.1181}{1.9757} = 81.8°$$

so that the reflected wave has 7% of the amplitude of the incident wave, and is almost 90° behind it in phase.

If the iliac junction is treated as a division into three equal branches, as in Fig. 31, then

$$\lambda = 3x\left(\frac{0.4}{0.65}\right)^2 \cdot \frac{350}{450} \cdot \frac{M''_{10}(4)}{M''_{10}(6.5)} \exp i\left\{\varepsilon''_{10}(4)-\varepsilon''_{10}(6.5)\right\}$$

which reduces to $\lambda = 0.791Q + 0.1451$

giving $\left|\frac{A_4}{A_1}\right| = 0.1418$ and a phase-lag of $39.53°$

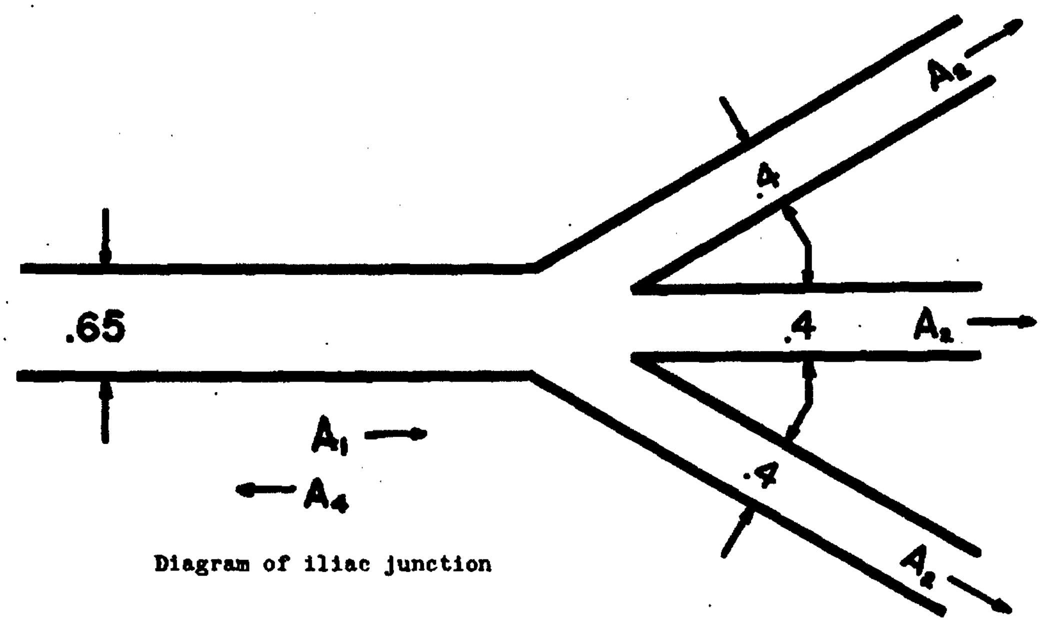


Diagram of iliac junction

Fig. 31

These results show that for a wide range of conditions, reflection will cause a moderate increase in amplitude of the transmitted pressure-wave, for a correspondingly moderate increase in total cross-sectional area at the junction. They also show that there is a value of the area-ratio at which reflection is a minimum. From the point of view of transmission of energy through the junction, this condition of minimum reflection is, of course, an optimum. In electrical jargon, it is the condition of optimum impedance-matching at the junction. An analogous situation arises, at much higher frequencies, in the problem of transmission of electromagnetic energy in wave-guides.

In view of what has been said in the past about standing waves in the arterial system, (Hamilton and Dow, 1939) the relationship of the standing wave concept to the above results ought to be considered. Whether one uses the idea of standing

waves or not is largely a matter of choice of terminology. As a simple example, consider a junction or discontinuity at which the reflection-coefficient has an amplitude of 10% and there is no phase-lag, and, for simplicity, assume that the wave-velocity is independent of frequency or the size of the tube. Let the incident wave-form be

$$Ae^{in(t-z/c)}$$

The reflected wave will be

$$\frac{1}{10} Ae^{in(t+z/_c)}$$

and the resultant of these two may be equally well described as

$$A_1 e^{in(t-z/_c)} + \frac{1}{10} A_{1} e^{in(t+z/_c)} \qquad \ldots 7.14.$$

or as

$$\frac{9}{10} Ae^{in(t-z/_c)} + \frac{1}{10} \left\{ Ae^{in(t-z/_c)} + Ae^{in(t+z/_c)} \right\} \qquad \ldots 7.15.$$

which latter may be written

$$\frac{9}{10} Ae^{in(t-z/_c)} + \frac{1}{5} Ae^{int} \cos\frac{nz}{c} \qquad \ldots 7.16.$$

7.14 is the sum of the incident wave and a wave of one-tenth of its amplitude travelling in the opposite direction. 7.16 is the sum of a wave nine-tenths of the amplitude of the incident wave and a standing wave of one-fifth of its amplitude.

In wave-guide technology, this latter method of describing conditions has become standard practice, and a method of indicating the efficiency of energy-transfer has been devised, the standing-wave-ratio. Since the voltage is measured, it is called the v.s.w.r. (voltage standing-wave-ratio). The corresponding quantity in oscillatory fluid flow will be the pswr (the pressure-standing-wave ratio) measured as follows:

If there were no reflection, measurements of amplitude of pressure variation would show the same amplitude at all distances from the junction. However, if there is reflection, 7.16 above shows that at points half a wave-length apart,

there will be minima and maxima of amplitude. (In the extreme case of total reflection these become nodes and antinodes) The ratio

$$\frac{\text{Maximum Amplitude}}{\text{Minimum Amplitude}}$$

is the standing-wave-ratio, and is a measure of the efficiency of energy-transfer through the junction. In the example given in 7.16 the pswr is $\frac{11}{9} = 1.22$. If there is total reflection, with no transmission of energy, the pswr is infinite. The method of measurement of the pswr described above is useless in the arterial system, since it would be impossible anywhere to find a length of artery in which there would be a distance of half a wave-length free from other junctions. There is another approach to the measurement of the pswr which can be used if simultaneous measurements of pressure and pressure-gradient are available.

Let the Fourier Series for the pressure and the pressure-gradient be

$$p = p_o + \sum_m (C_m \cos mnt + D_m \sin mnt)$$

$$= p_o + \sum_m P_m \cos(mnt - \psi_m)$$

$$-\frac{\partial p}{\partial Z} = A_o + \sum_m (A_m \cos mnt + B_m \sin mnt)$$

$$= A_o + \sum_m M_m \cos(mnt - \varphi_m)$$

If there is no reflected wave,

$$A_m = \frac{mn}{c_o}(D_m X_m + C_m Y_m)$$

$$B_m = \frac{mn}{c_o}(C_m X_m - D_m Y_m) \qquad \ldots 7.17.$$

and these may be regarded as simultaneous equations for X_m and Y_m. In terms of modulus and phase they may be written

$$|X_m - iY_m| = \frac{M_m}{P_m}\frac{C_o}{mn} \qquad \ldots 7.18.$$

$$ph(X_m - iY_m) = \psi_m - \varphi_m - \pi/2 \qquad \ldots 7.19.$$

If there is a reflected wave the relationship

$$-\frac{\partial p}{\partial z} = \frac{in}{c} \cdot p$$

no longer holds. If the origin of z is taken at the point of reflection, and the place of measurement is a distance l from this, i.e. at $z=-l$, then the m^{th} harmonic of the pressure will be of the form

$$P_m' e^{-i\psi_m'} \cdot e^{imn(t-z/c)} + P_m'' e^{-i\psi_m''} \cdot e^{imn(t+z/c)} \qquad \ldots 7.20.$$

so that at the point of measurement,

$$P_m e^{-i\psi_m} = P_m' e^{-i\psi_m' + imnl/c} + P_m'' e^{-i\psi_m''} \cdot e^{-imnl/c} \qquad \ldots 7.21.$$

and

$$M_m e^{-i\varphi_m} = \frac{in}{\rho_m} \left\{ P_m' \, e^{-i\psi_m' + imnl/c} - P_m'' \, e^{-i\psi_m''} \cdot e^{-imnl/c} \right\} \qquad \ldots 7.22.$$

The ratio $\frac{M_m}{P_m} \quad \frac{c_o}{mn}$ now depends on the reflection-coefficient at the junction, and the distance of the point of measurement from it. If equation 7.21 is divided by 7.22, we have

$$\frac{1}{i} \cdot \frac{M_m c_m}{P_m mn} \cdot e^{i(\psi_m - \varphi_m)} = \frac{P_m' e^{-i\psi_m^{A} + imnl/c_m} - P_m'' e^{-i\psi_m'' - imnl/c_m}}{P_m' e^{-i\psi_m' + imnl/c_m} + P_m'' e^{-i\psi_m'' - imnl/c_m}}$$

Write

$$\frac{c_m}{imn} \cdot \frac{M_m}{P_m} \cdot \frac{M_m}{P_m} e^{i(\psi_m - \varphi_m)} = K$$

Then

$$\frac{P_m'' e^{i\psi_m''}}{P_m' e^{-i\psi_m'}} \cdot e^{-2imnl/c_m} = \frac{1-K}{1+K} \qquad \ldots 7.23.$$

The quantity $\frac{P_m'' e^{-i\psi_m''}}{P_m' e^{-i\psi_m'}}$ is the reflection coefficient of the junction in complex form, i.e., it is the same as the $\frac{A_4}{A_1}$ of equations 7.5 and 7.13. We have therefore,

$$\frac{1-\lambda}{1+\lambda} = \frac{1-K}{1+K} e^{2imnl/c_m} \qquad \ldots 7.24.$$

If, therefore, the geometry of the junction is known, the theory can be tested by calculating λ and K, and attempting to find a c_o which is consistent for all harmonics.

There is another type of simple discontinuity which has the opposite effect from that of a junction or a constriction, and which has an important practical application. Some types of electromagnetic flowmeter require the insertion in the artery of a short length of rigid tube, or may confine the artery by means of a cuff. The effect of such an artifact on steady flow is negligible, but if the flow has large oscillatory components distortion is introduced. Consider a tube, elastic for the most part, which has in it a stationary rigid portion of length l. As in previous calculations, let the incident pressure function be $A_1 e^{in(t-z/c)}$ and let $A\, e^{in(t+z/c)}$ be the reflected wave. Take $z=0$ at the incident end of the rigid portion and let $A_2 e^{int}$, $A_3 e^{int}$ be the pressures at its two ends - i.e. at $z=0$, $z=l$, respectively. This is correct, since the transmission velocity in the rigid portion is infinite. For continuity of pressure, the transmitted wave must be $A_3 e^{in(t-z/c)}$, and also

$$A_1+A_4 = A_2 \qquad \ldots 7.25.$$

For continuity of flow, since the pressure gradient in the rigid part is $(A_2-A_3)/l$,

$$\frac{A_1-A_4}{\rho c} M''_{10} e^{i\varepsilon''_{10}} = \frac{A_2-A_3}{in\rho l} . M'_{10} e^{i\varepsilon'_{10}} = \frac{A_3}{\rho c} . M''_{10} e^{i\varepsilon''_{10}} \qquad \ldots 7.26.$$

The value of α is the same at all points, since the tube is assumed to be of the same diameter throughout, and therefore

$$A_1 = A_4 = \left\{1+ \frac{2c}{inl} . \frac{M'_{10}}{M''_{10}} . e^{i(\varepsilon'_{10}-\varepsilon''_{10})}\right\} \qquad \ldots 7.27.$$

For the limiting condition of stiff constraint, this will simplify, and the ratio of the transmitted wave to the incident wave will be

$$\frac{A_5}{A_1} = 1-\frac{A_4}{A_1} = \frac{1}{1+\frac{inl}{2c_0} . \frac{c_0}{c}} \qquad \ldots 7.28.$$

The pressure-gradient in the tube may also be found in terms of A_1. We have, in fact

$$\frac{A_2-A_3}{in\rho l} = \frac{A_1}{\rho c} \quad \frac{1}{1+\frac{inl}{2c_0} . \frac{c_0}{c}} \qquad \ldots 7.29$$

so that the rate of flow is reduced by the insertion of the rigid tube in this same ratio. It should therefore be possible to calculate from the observed flow pattern

produced by an electromagnetic flowmeter what the flow would have been had it not been distorted by the insertion.

As a practical example, in the flowmeter used by Inouye (1954), the artery was confined in a cuff 15mm. long. In the femoral artery of the dog, taking c=450 cm/sec (McDonald) and a pulse-frequency of 3 cycles per second, i.e. $n=6\pi$.

$$A_5 = \frac{1}{1 + \frac{im\pi}{100}} \qquad \ldots 7.30.$$

where m is the order of the harmonic. The ratio c_o/c has been neglected, since the calculation is only intended to show the order of magnitude of the effect. For the fourth harmonic the reduction in amplitude is about 1% and the phase-lag about 7°, so that for this instrument the effect of the cuff is negligible. It is not unknown, however, for electromagnetic flowmeters to be used, with flexible plastic tubes leading from a severed artery, in which the effective length of the rigid insert is ten times as long as this, or more. Consider a rigid insert 15 cm. long. A table of $\left|\frac{A_5}{A_1}\right|$ and the phase-lag is given below for the first four harmonics

Harmonic	$\lvert A_5/A_1\rvert$	-phase A_5/A_1
1	0.946	19°
2	0.847	32.15°
3	0.728	43.3°
4	0.643	51.5°

This table shows that results from an electromagnetic flowmeter with a rigid insert of this length cannot represent normal conditions in the artery. Any rigid insert or cuff which confines the artery acts as a low-pass filter and introduces both phase and amplitude distortion. It is of the greatest importance, therefore, that inserts of this kind should be kept as short as possible. For the benefit of those who may wish to correct observations of flow which have been made with an electromagnetic flowmeter with a rigid insert, the details are given below:

Let the Fourier Series fitting the observed flow be

$$A_o + \sum_m A_m \cos mnt + B_m \sin mnt)$$

Then if f, is the pulse-frequency, $n=2\pi f$, and if A_m', B_m' are the Fourier Coefficients for the corrected flow,

$$A_m' = A_m + B_m.2\pi fm l/c$$

$$B_m' = B_m - A_m.2\pi fm l/c$$

In another type of electromagnetic flowmeter used by Spencer (1956), the artery is pressed between the poles of the magnet, its diameter across the gap being reduced by about 20%, but left free to expand in the perpendicular direction. Spencer claims that this will have a trivial effect on the rate of flow, since the cross-sectional area is reduced by only 6%. Whilst the present theory does not take into account any effect produced by the change in shape, it is of some interest to calculate the reflection produced by this order of change in area. Let the width of the pole-pieces of the magnet be $l$cm. It will be assumed that the velocity of wave-propagation is unchanged by the lateral compression of the artery. Since l is small, it will be necessary to take into account repeated reflections at the two ends. Let the pressure in the absence of constriction be $A_1 e^{in(t-z/c)}$ and take the origin of z at the point of constriction i.e., at the proximal end of the narrower portion. The value of λ (see 7.4 and 7.5 above) for the reflection at this point is

$$\lambda = 0.94 \left\{\frac{M'_{10}(\alpha_2)}{M'_{10}(\alpha_1)}\right\}^{\frac{1}{2}} e^{\frac{1}{2}i\left(\varepsilon'_{10}(\alpha_2)-\varepsilon'_{10}(\alpha_1)\right)} \qquad \ldots 7.31.$$

and at the distal end it will be the reciprocal of this.

If A_4 is the amplitude of the reflected wave at the proximal end,

$$\frac{A_4}{A_1} = \frac{1-\lambda}{1+\lambda}$$

and A_3 is the amplitude of the transmitted wave,

$$\frac{A_3}{A_1} = \frac{2}{1+\lambda}$$

when this reaches the distal end, its amplitude will be

$$A_1 = \frac{2}{1+\lambda} \cdot e^{-in\,l/c}$$

and at this point it will give rise to a reflected wave of amplitude

$$A_1 \cdot \frac{2}{1+\lambda} \cdot \frac{\lambda-1}{\lambda+1} \cdot e^{-in\,l/c}$$

which, in travelling back to the proximal end of the constriction will have its amplitude reduced to

$$A_1 \cdot \frac{2}{1+\lambda} \cdot \frac{\lambda-1}{\lambda+1} \cdot e^{-2in\,l/c}$$

At this point it will be transmitted back into the larger tube with amplitude

$$A_1 \frac{2}{1+\lambda} \cdot \frac{\lambda-1}{\lambda+1} \cdot \frac{2\lambda}{1+\lambda} \cdot e^{-2in\,l/c}$$

It will be seen that, for the higher orders of reflection, each time the wave traverses the constriction in both directions it reappears at the proximal end as a reflected wave with its amplitude reduced in the ratio

$$\frac{2\lambda\,(\lambda-1}{(1+\lambda)^2}\, e^{-2in\,l/c} \qquad \ldots 7.31.$$

Adding together all the reflected waves except the first, we have a geometrical progression whose first term is

$$A_1 \frac{2}{1+\lambda} \cdot \frac{2\lambda(\lambda-1)}{(1+\lambda)^2}\, e^{-2in\,l/c}$$

and whose common ratio is given by 7.31 above. The sum of this series is

$$A_1 \frac{2}{1+\lambda} \cdot \frac{2\lambda\,(\lambda-1)\,e^{-2in\,l/c}}{(1+\lambda)^2 - 2\lambda\,(\lambda-1)\;e^{-2in\,l/c}}$$

In calculating the flow (see 7.4 above) the sum of all the reflected terms must be subtracted from A_1. The ratio of the flow in the tube with the constriction in place to that when there is no constriction will be

$$1 - \frac{1-\lambda}{1+\lambda} - \frac{2}{1+\lambda} \cdot \frac{2}{1+\lambda} \cdot \frac{2\lambda(\lambda-1)\,e^{-2in\,l/c}}{(1+\lambda)^2 - 2\lambda\,(\lambda-1)\,e^{-2in\,l/c}}$$

which reduces to

$$\frac{2\lambda}{1+\lambda} \left\{ 1 - \frac{2\,(\lambda-1)\,e^{-2in\,l/c}}{(1+\lambda)^2 - 2\lambda\,(\lambda-1)\;e^{-2in\,l/c}} \right\} \qquad \ldots 7.32.$$

If the flowmeter constricts the tube by only a small fraction of its total area, 7.32 may be approximated by writing $\lambda = 1-\delta$, and neglecting higher powers of δ. 7.32 then reduces to

$$\frac{(1-\delta)}{(1-\delta/_2}\left\{1 + \frac{\delta}{2}\; e^{-2in\,l/c}\right\}$$

$$= 1 - \frac{\delta}{2}\,(1-e^{-2in\,l/c}) \qquad \ldots 7.33.$$

so that for a slight constriction of short length, the effect is very small indeed. For Spencer's instrument, assuming that the poles of the magnet are 1cm wide,

$$\frac{2nl}{c} \sim \frac{6\pi}{250} = < 0.1$$

and the modulus of $e^{-2inl/c}$ will be given by

$$e^{-\frac{2\pi y}{x} \cdot \frac{nl}{c}}$$

so that for values of $\alpha \geq 3$ the modulus of

$$1 - e^{-2inl/c}$$

will be less than 0.005, and the effect on the flow will be very small.

It would seem from these calculations that the distortion of the normal flow introduced by this type of flowmeter is negligible, so far as constriction is concerned. The effect of the change in shape caused by the lateral compression of the artery is not amenable to simple mathematical treatment.

SECTION VIII

FIRST-ORDER PERTURBATION CORRECTION FOR FINITE VARIATION IN DIAMETER.

Up to this point, the rate of flow and the average velocity have been used indiscriminately as indicators of "flow", it being assumed that $Q = \pi R^2 \bar{w}$. But this is approximately only, since at any time the radius is not R, but $R+\xi$, and ξ varies with the time. A better approximation would be

$$Q = \frac{A_1}{\rho_0 c} \cdot \pi R^2 \bar{w} \left(1+\frac{2\xi}{R}\right) \qquad \ldots 8.1.$$

and inserting the value of $\frac{2\xi}{R}$ this becomes

$$Q = \frac{A_1}{\rho_0 c} \cdot \pi R^2 \bar{w} \left(1+\frac{\bar{w}}{c}\right) \qquad \ldots 8.2$$

Even 8.2 is not fully corrected for the oscillatory variation in radius. In the original equations, R has been regarded as the boundary from the point of view of the motion of the liquid. In fact the boundary of the liquid is at $R+\xi$. If we replace R by $R+\xi$ in 3.11 and assume that w is still essentially a function of y, i.e., that the lines of laminar flow expand and contract with the tube, it may be written

$$\frac{\partial^2 w}{\partial y^2} + \frac{1}{y}\frac{\partial w}{\partial y} - \frac{R^2}{\nu}\left(1+\frac{2\xi}{R}\right) \cdot \frac{\partial w}{\partial t} = \left(1+\frac{2\xi}{R}\right) \cdot \frac{R^2}{\mu}\frac{\partial p}{\partial z} \qquad \ldots 8.3.$$

the inertia terms and the term in $\frac{d^2w}{dz^2}$ being omitted. If we seek a solution of 8.3 which is of the same form as that for a constant radius, we can imagine $\partial p/\partial z$ represented by a Fourier Series in $n(t-z/c)$, and corresponding Fourier Series for w and $\frac{2\xi}{R}$ substituted in the equation. The products of the Fourier Series can be multiplied out, and a set of equations for the velocity components obtained by collecting up corresponding terms. The wave-velocity is not the same at all frequencies, however, and on multiplying two periodic terms together there will be some exponential terms "left over" as it were, which would disappear (being equal to unity) in a system with constant wave-velocity. A typical term is

$$e^{in(t-z/c_1)} \times e^{in(t-z/c_1)}$$

which has to be compared with

$$e^{2in(t-z/c_2)}$$

where c_1 is the wave-velocity for a frequency $\frac{n}{2\pi}$ and c_2 is the wave-velocity for twice this frequency. The question is, therefore, how far does

$$e^{2iin(1/c_1 - 1/c_2)}$$

differ from unity? If four harmonics are taken in the Fourier Series, the quantities to be considered are

$$\frac{1}{c_2} - \frac{1}{c_1} \quad , \quad \frac{3}{c_3} - \frac{2}{c_2} - \frac{1}{c_1}$$

$$\frac{1}{c_4} - \frac{1}{c_2} \quad , \quad \frac{4}{c_4} - \frac{3}{c_3} - \frac{1}{c_1}$$

where c_1, c_2, c_3, c_4 are the wave-velocities for the four harmonics. The largest of these is $\frac{1}{c_2} - \frac{1}{c_1}$, and for $\alpha=2$ the wavelength of this is approximately four times that of the fundamental. For $\alpha=5$ the ratio is greater than 10:1. It is reasonable, therefore, to use a simple perturbation method, along the lines described, to solve equation 8.3. It might well be thought that this correction for radial expansion is less important in principle than the correction for the quadratic terms in the equation of motion. This is not necessarily so, for both corrections are concerned with terms of the order of $\bar{w}/_c$, and could be of equal importance. It will, in fact, be shown that they are, at moderate values of α, of the same order of magnitude.

Since 8.3 is non-linear, we may no longer write the pressure-gradient as

$$A_o + A_1 e^{int} \quad + \quad A_2 e^{2int} + \; .....$$

and take the real part, or half the interaction terms will be lost. It is necessary to start from the pressure gradient in real form and write down its exact complex equivalent. Assume that

$$-\frac{\partial p}{\partial z} = M_o + M_1 \cos(nt+\varphi_1) + M_2 \cos(2nt+\varphi_2) + ... \qquad ...8.4.$$

If we define A_o, A_1, A_2.... by

$$A_o = M_o$$

$$A_1 = \tfrac{1}{2} M_1 e^{i\varphi_1}$$

$$A_2 = \tfrac{1}{2} M_2 e^{i\varphi_2}$$

and so on, then

$$-\frac{\partial p}{\partial z} = A_o + A_1 e^{int} + A_1^* e^{-int} + A_2 e^{2int} + \; .... \qquad ...8.5.$$

using a standard notation for conjugate complex quantities. Also assume

$$w = w_o + w_1 e^{int} + \overset{*}{w}_1 e^{-int} + \; ..... \qquad ...8.6.$$

and $$\xi = \xi_1 e^{int} + \xi_1^* e^{-int} + \ldots \qquad \ldots 8.7.$$

6.19

Equation 6.13 will be true for each harmonic, and therefore

$2\xi/R \neq \bar{w}/c$

$$\frac{2\xi}{R} = \frac{\bar{w}_1}{c_1} e^{int} + \frac{\bar{w}_1^*}{c_1^*} e^{-int} + \ldots \qquad \ldots 8.8.$$

in which c_m is the complex wave-velocity for the m^{th} harmonic. Taking the values of the $\bar{w}_m$ already obtained as an adequate approximation to use in substituting for $2\xi/R$ in 8.8 we have

$$1 + \frac{2\xi}{R} = 1 + \frac{1}{c_o}\left\{C_1 e^{int} + C_1^* e^{-int} + \ldots\right\} \qquad \ldots 8.9.$$

in which $$C_m = (X_m - iY_m) \cdot \frac{A_m R^2}{i\mu\alpha_m^2}\left\{1 + \eta F_{10}(\alpha_m) \ldots\right\} \qquad \ldots 8.10.$$

X and Y have the same meaning as in Section III, i.e.,

$$c_o/c_m = X_m - iY_m$$

For the limiting condition of stiff constraint this reduces to

$$C_m = \frac{A_m R^2}{i\mu\alpha_m^2} \cdot \left(\frac{3M_{10}'(\alpha_m)}{4}\right)^{1/2} e^{\frac{1}{2}i\epsilon_{10}'(\alpha_m)} \qquad \ldots 8.11.$$

If the above expressions for $\partial p/\partial z$ and $1 + \frac{2\xi}{R}$ are inserted into the right-hand side of 8.3 we have, omitting the constant factor R^2/μ and changing sign,

$$\begin{aligned} -\left(1+\frac{2\xi}{R}\right)\frac{\partial p}{\partial z} &= A_o + A_1 e^{int} + A_1^* e^{-int} + A_2 e^{2int} + \ldots \\ &+ \frac{A_o}{c_o}\left(C_1 e^{int} + C_1^* e^{-int} + C_2 e^{2int} + C_2^* e^{-2int}\right) \\ &+ \frac{1}{c_o}\left(A_1 e^{int} + A_1^* e^{-int}\right)\left(C_1 e^{int} + C_1^* e^{-int} + \ldots\right) \\ &+ \frac{1}{c_o}\left(A_2 e^{2int} + A_2^* e^{-2int}\right)\left(C_1 e^{int} + C_1^* e^{-int} + \ldots\right) \\ &+ \ldots \end{aligned} \qquad \ldots 8\text{-}12.$$

We now consider the term in $1 + \frac{2\xi}{R}$ on the left-hand side of 8.3. This becomes

$$\frac{R^2}{\nu}\left(1+\frac{2\xi}{R}\right)\cdot\frac{\partial w}{\partial t} =$$

$$i\alpha^2\,(w_1e^{int}-w_1^*e^{-int}) + 2i\alpha^2(w_2e^{2int}-w_2^*e^{-2int}) + \ldots$$

$$+\frac{i\alpha^2}{c_o}\,(w_1e^{int}-w_1^*e^{-int})\,(c_1e^{int}+C_1^*e^{-int}+C_2e^{2int}+\ldots)$$

$$+\frac{2i\alpha^2}{c_o}\,(w_2e^{2int}-w_2^*e^{-2int})\,(C_1e^{int}+C_1^*e^{-int}+C_2e^{2int}+\ldots)$$

$$+\ \ldots \qquad \ldots 8.13.$$

If now 8.12 and 8.13 are inserted in 8.3, and corresponding powers of e^{int} are collected, a set of equations for w_o, w_1, w_1^* ..... can be written down. The terms independent of e^{int} give the equation

$$\frac{d^2w_o}{dy^2}+\frac{1}{y}\,\frac{dw_o}{dy} = \frac{A_oR^2}{\mu} - \frac{R^2}{\mu c_o}\,(A_1C_1^* + A_1^*C_1 + \ldots.)$$

$$+\frac{i\alpha^2}{c_o}\left\{C_1^*w_1 - C_1w_1^* + 2(C_2^*w_2 - C_2w_2^*) + \ldots\right\} \qquad \ldots 8.14.$$

An approximate solution, correct to order $\frac{1}{c_o}$, can be obtained by inserting the known forms for w_1, w_1^*.... on the right-hand side of this equation. If this is done, the integration can be carried through, and the result expressed in terms of functions already known. The first term on the right-hand side gives the usual Poiseuille solution. Since 8.14 is linear in the unknown w_o, we may consider the contribution to the solution from each term separately. The general term for the m^{th} harmonic gives the equation

$$\frac{d^2w_o}{dy^2}+\frac{1}{y}\,\frac{dw_o}{dy} = -\frac{1}{c_o}\,\frac{R^2}{\mu}\,(A_mC_m^* + A_m^*\,C_m) + \frac{im\alpha^2}{c_o}\,(C_m^*w_m - C_mw_m^*) \qquad \ldots 8.15.$$

The value of α appropriate to the m^{th} harmonic is $\alpha_m = \alpha\ \ m$, so that $\alpha_m{}^2 = m_\alpha^2$. The values of w_m, w_m^* to be inserted in 8.15 will be (expressing 6.3 in terms of the pressure gradient,)

$$w_m = \frac{A_m R^2}{i\mu 1 n \alpha^2} \left\{ 1 + \eta_m \frac{J_o(\alpha_m y i^{3/2})}{J_o(\alpha_m i^{3/2})} \right\}$$

and

$$w_m^* = \frac{A_m^* R^2}{-i\mu 1 n \alpha^2} \left\{ 1 + \eta_m^* \frac{J_o(\alpha_m y i^{-3/2})}{J_o(\alpha_m i^{-3/2})} \right\}$$

Inserting these in 8.15, this becomes

$$\frac{d^2 w_o}{dy^2} + \frac{1}{y}\frac{dw_o}{dy} = \frac{1}{c_o}\frac{R^2}{\mu} \cdot A_m C_m^* \cdot \eta_m \cdot \frac{J_o(\alpha_m y i^{3/2})}{J\ (\alpha_m i^{3/2})}$$

$$+ \frac{1}{c_o}\frac{R}{\mu} A_m^* C_m \eta_m^* \frac{J_o(\alpha_m y i^{3/2})}{J_o(\alpha_m i^{3/2})} \qquad \text{...8.16.}$$

the constant terms cancelling. Since for any Bessel Function of order zero,

$$\left(\frac{d^2}{dy^2} + \frac{1}{y}\frac{d}{dy} \right) J_o(ky) = -k^2 J_o(ky) \qquad \text{...8.17.}$$

the solution of 8.16 which is zero at y=1 is

$$\frac{1}{c_o}\frac{R^2}{1^3 \alpha_m^2 \mu} \cdot A_m C_m^* (\eta_m) \left\{ 1 - \frac{J_o(\alpha_m y i^{3/2})}{J_o(\alpha_m i^{3/2})} \right\}$$

$$+ \frac{1}{c_o}\frac{R^2}{1^3 \alpha_m^3 \mu} \cdot A_m^* C_m (\eta_m^*) \left\{ 1 - \frac{J_o(\alpha_m i^{-3/2})}{J_o(\alpha_m i^{-3/2})} \right\} \qquad \text{...8.18.}$$

and this may be written

$$+ \frac{1}{c_o}\frac{R^2}{i\alpha_m^2 \mu} \cdot A_m C_m^* (-\eta_m) \left\{ 1 - \frac{J_o(\alpha_m y i^{-3/2})}{J_o(\alpha_m i^{-3/2})} \right\}$$

$$- \frac{1}{c_o} \cdot \frac{R^2}{i\alpha_m^2 \mu} \cdot A_m^* C_m (-\eta_m^*) \left\{ 1 - \frac{J_o(\alpha_m i^{-3/2})}{J_o(\alpha_m i^{-3/2})} \right\} \qquad \text{...8.19.}$$

and therefore the contribution of this pair of terms to the average velocity is

$$+ \frac{1}{c_o} \cdot \frac{A_m^* R^2}{\mu \alpha^2} \cdot \frac{1}{i} \cdot C_m^* \cdot (-\eta_m) \cdot M_{10}'(\alpha_m)\ e^{i\epsilon_{10}'(\alpha_m)}$$

$$- \frac{1}{c_o} \cdot \frac{A_m^* R^2}{\mu \alpha^2} \cdot \frac{1}{i} \cdot C_m^* (-\eta_m^*))\ M_{10}'(\alpha_m)\ e^{-i\epsilon_{10}'(\alpha_m)} \qquad \text{...8.20.}$$

Inserting the expressions for C_m and C_m^* this becomes, after some obvious reductions,

$$\frac{1}{2c_o}\left(\frac{M_m}{mn\,l}\right)^2 |X-iY| M_{10}'(\alpha_m) M_{10}''(\alpha_m) \cos\left\{\epsilon_{10}'(\alpha_m)-\epsilon_{10}''(\alpha_m)+\ \mathrm{ph}(X_m+iY_m)+\mathrm{ph}(-\eta_m)\right\}$$

For the limiting condition of stiff constraint this reduces to

$$\frac{1}{c_o}\cdot\frac{1}{2}\cdot\left(\frac{M_m}{mn\rho}\right)^2\cdot\frac{\sqrt{3}}{2}\cdot\left\{M_{10}'(\alpha_m)\right\}^{3/2}\cos\frac{\epsilon_{10}'(\alpha_m)}{2} \qquad \text{...8.21.}$$

It is possible, therefore, to prepare a table of standard correction functions by calculating

$$E(m,-m) = \frac{\sqrt{3}}{4}\left\{M_{10}'(\alpha_m)\right\}^{3/2}\cdot\cos\frac{\epsilon_{10}'(\alpha_m)}{2} \qquad \text{...8.22.}$$

for the full range of values of α. For any given pulse form the correction to the steady term will be

$$\frac{1}{c_o}\sum_m\left(\frac{M_m}{mn\rho}\right)^2 E(m,-m) \qquad \text{...8.23.}$$

and this will be in the same direction as the main term.

We now turn to the construction of the corresponding standard correction functions $E(l,m)$ and $E(l-m)$, being the effect of the l^{th} and m^{th} harmonics on the $(l+m)^{th}$ and $(l-m)^{th}$ harmonics respectively. The equation for the former is

$$\frac{d^2w}{dy^2}+\frac{1}{y}\frac{dw}{dy}-i(l+m)\alpha^2 w = -\frac{1}{c_o}\frac{R^2}{\mu}(A_m C_l + A_l C_m)$$

$$+\frac{i\alpha^2}{c_o}\cdot(mC_l w_m + l\,C_m w_l) \qquad \text{...8.24.}$$

Inserting the values of w_m and w_e this becomes

$$\frac{d^2w}{dy^2}+\frac{1}{y}\frac{dw}{dy}-i(l+m)\alpha^2 w = \frac{1}{c_o}\frac{R^2}{\mu}C_l A_m \eta_m\frac{J_o(\alpha_m y i^{3/2})}{J_o(\alpha_m i^{3/2})}$$

$$+\frac{1}{c_o}\frac{R^2}{\mu}C_m A_l \eta_l\frac{J_o(\alpha_l y i^{3/2})}{J_o(\alpha_l i^{3/2})} \qquad \text{...8.25.}$$

and this can be integrated by using the well-known result:

If

$$\frac{d^2w}{dy^2} + \frac{1}{y}\,\frac{dw}{dy} + k^2 w = \frac{AJ_0(ly)}{J_0(l)}$$

then the integral of this which vanishes at y = 1 is ¶

$$w = \frac{A}{k^2 - l^2}\left\{\frac{J_0(ly)}{J_0(l)} - \frac{J_0(ky)}{J_0(k)}\right\} \quad k \quad l \qquad \ldots 8.26.$$

The solution of 8.25 is, therefore,

$$\frac{1}{i^3\,(l+m-m)\alpha^2}\cdot\frac{1}{c_0}\cdot C_l A_m \cdot \eta_m \cdot \left[1 - \frac{J_0(\alpha_{l+m} y i^{3/2})}{J_0(\alpha_{l+m} i^{3/2})} - \left\{1 - \frac{J_0(\alpha_m y i^{3/2})}{J_0(\alpha_m i^{3/2})}\right\}\right]$$

together with the same expression with l and m interchanged. The corresponding average velocity will be

$$\frac{1}{c_0}\,\frac{R^2}{\mu}\cdot C_l \cdot A_m \cdot(-\eta_m)\cdot\frac{1}{i\,l\alpha^2}\left\{M'_{10}(\alpha_{l+m})\, e^{i\epsilon'_{10}(\alpha_{l+m})} - M'_{10}(\alpha_m)\, e^{i\epsilon'_{10}(\alpha_m)}\right\}$$

together with the same expression with l and m interchanged.

We may, therefore, write the above correction in the form

$$-\frac{1}{c_0}\left(\frac{A_m R^2}{\mu m\alpha^2}\right)\left(\frac{A_l R^2}{\mu l\alpha^2}\right)\cdot E(l,m)$$

where

$$E(l,m) = (-\eta_m)\cdot F(l,m) + (-\eta_l)\cdot F(m,l) \qquad \ldots 8.27.$$

¶ In imposing the condition that all the correction terms vanish at y=1, a further approximation is being made. Physically, it enforces the condition that the motion of the wall is due to the main terms only and the correction terms have no effect. Since the correction terms are small, this approximation may be adequate. For complete consistency, the arbitrary constants in the expressions for average velocity which are substituted in the equation should be left 'floating' and the fully corrected solution substituted back in the equations of motion of the tube. The 'frequency-equation' would then be non-linear, and the pulse-velocity would depend on the particular form of the pressure function. The same situation will arise if a similar method is used to calculate the inertia-term correction.

and

$$F(l,m) = \frac{m}{l}\,(X_l - iY_l) M''_{10}(\alpha_l) e^{i\epsilon''_{10}(\alpha_l)} \left\{ M'_{10}(\alpha_{l+m}) e^{i\epsilon'_{10}(\alpha_{l+m})} - M'_{10}(\alpha_m) e^{i\epsilon'_{10}(\alpha_m)} \right\}$$

We now consider the actual form of the $(l+m)^{th}$ harmonic. For a pressure-gradient in real form it will be necessary to combine the two terms

$$w_{l+m} e^{i(l+m)nt} + w_{l+m} e^{-i(l+m)nt}$$

The correction term will be therefore, in real form,

$$-\frac{1}{c_o}\left(\frac{M_m}{mn\rho}\right)\cdot\left(\frac{M_l}{ln\rho}\right)|E(l,m)|\cos\left\{(l+m)nt + \varphi_l + \varphi_m + phE(l,m)\right\} \qquad \ldots 8.28.$$

and it will be convenient to have a table of $E(l,m)$ in modulus and phase form. For the limiting condition of stiff constraint the formula for $E(l,m)$ simplifies considerably. $E(l,m)$ then becomes

$$E(l,m) = F(l,m) + F(m,l)$$

and

$$F(l,m) = \frac{m}{l}\left\{\frac{3}{4}\cdot M'_{10}(\alpha_l)\right\}^{\frac{1}{2}} \cdot e^{i\cdot\frac{1}{2}\epsilon'_{10}(\alpha_l)} \cdot \left\{ M'_{10}(\alpha_{l+m}) e^{i\epsilon'_{10}(\alpha_m)} - M'_{10}(\alpha_m) e^{i\epsilon'_{10}(\alpha_m)} \right\} \qquad \ldots 8.29.$$

The formula for $F(l,-m)$ can be written down at once by substituting $-m$ for m in the above. Thus

$$F(l,-m) = -\frac{m}{l}\left\{\frac{3}{4}M'_{10}(\alpha_l)\right\}^{\frac{1}{2}} \cdot e^{i\cdot\frac{1}{2}\epsilon'_{10}(\alpha_l)} \left\{ M'_{10}(\alpha_{l-m}) e^{i\epsilon'_{10}(\alpha_{l-m})} - M'_{10}(\alpha_m) e^{-i\epsilon'_{10}(\alpha_m)} \right\} \qquad \ldots 8.30.$$

The above formulae do not apply when l or $m = 0$. For the effect on the m^{th} harmonic of its own interaction we have

$$\frac{d^2w}{dy^2} + \frac{1}{y}\frac{dw}{dy} + i^3 m\alpha^2 w = -\frac{R^2}{\mu c_o} A_o C_m \qquad \ldots 8.31.$$

and since the right-hand side is constant the solution of this is

$$w = \frac{1}{c_o}\cdot\frac{A_o R^2}{i\mu m\alpha^2}\cdot C_m \cdot \left\{1 - \frac{J_o(\alpha_m y i^{3/2})}{J_o(\alpha_m i^{3/2})}\right\}$$

and therefore the correction term is

$$- \frac{1}{c_o} \cdot \left(\frac{M_o}{mn\rho}\right) \cdot \left(\frac{M_m}{mn\rho}\right) \cdot E(m,0) \cdot \cos\left[mnt+\varphi_m+phE(m,0)\right]$$

in which

$$E(m,0) = (X_m-iY_m) \cdot M''_{10}(\alpha_m) \cdot e^{i\epsilon''_{10}(\alpha_m)} \cdot M' \; e^{i\epsilon'_{10}(\alpha_m)}$$

and for the limiting condition of stiff constraint this reduces to

$$E(m,0) = \frac{\sqrt{3}}{2}\left\{M''_{10}(\alpha_m)\right\}^{3/2} e^{i.3/2.\epsilon'_{10}(\alpha_m)} \qquad \ldots 8.32.$$

We now consider the practical application of these formulae. In the application to arterial flow, four harmonics in the pressure gradient are usually sufficient. The formulae for the components of the corrected average velocity are written out in full below:

$$\bar{W} = \frac{M_o R^2}{8\mu} + \frac{1}{c_o} \sum_{m=1}^{4} \left(\frac{M_m}{mn\rho}\right)^2 \cdot E(m,-m) \qquad \ldots 8.33.$$

$$W_1 = \frac{M_1}{n\rho_o} \cdot M''_{10} \sin(nt-\varphi_1+\epsilon''_{10})$$

$$- \frac{1}{c_o}\left(\frac{M_o}{n\rho_o}\right) \cdot \left(\frac{M_1}{n\rho_o}\right) \cdot |E(1,0)| \cos\left\{nt-\varphi_1+phE(1,0)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_2}{2n\rho_o}\right) \cdot \left(\frac{M_1}{n\rho_o}\right) |E(2,-1)| \cos\left\{nt-(\varphi_2-\varphi_1)+phE(2,-1)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_3}{3n\rho_o}\right) \cdot \left(\frac{M_2}{2n\rho_o}\right) |E(3,-2)| \cos\left\{nt-(\varphi_3-\varphi_2)+phE(3,-2)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_4}{4n\rho_o}\right) \cdot \left(\frac{M_3}{3n\rho_o}\right) |E(4,-3)| \cos\left\{nt-(\varphi_4-\varphi_3)+phE(4,-3)\right\} \qquad \ldots 8.34.$$

$$W_2 = \frac{M_2}{2n\rho_o} \cdot M''_{10}(\alpha_2) \sin\left\{2nt-\varphi_2+\epsilon''_{10}(\alpha_2)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_o}{2n\rho_o}\right) \cdot \left(\frac{M_2}{2n\rho_o}\right) \cdot |E(2,0)| \cos\left\{2nt-\varphi_2+phE(2,0)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_1}{n\rho_o}\right)^2 |E(1,1)| \cos\left\{2nt-2\varphi_1+phE(1,1)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_3}{3n\rho_o}\right)\cdot\left(\frac{M_1}{n\rho_o}\right)|E(3,-1)|\cos\left\{2nt-(\varphi_3-\varphi_1)+phE(3,-1)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_4}{4n\rho_o}\right)\cdot\left(\frac{M_2}{2n\rho_o}\right)|E(4,-2)|\cos\left\{2nt-(\varphi_4-\varphi_2)+phE(4,-2)\right\} \qquad \ldots 8.35.$$

$$W_3 = \frac{M_3}{3n\rho_o} \cdot M''_{10}(\alpha_3) \cdot \sin\left\{3nt-\varphi_3+\epsilon''_{10}(\alpha_3)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_o}{3n\rho_o}\right)\cdot\left(\frac{M_3}{3n\rho_o}\right)\cdot |E(3,0)|\cos\left\{3nt-\varphi_3+phE(3,0)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_2}{2n\rho_o}\right)\cdot\left(\frac{M_1}{n\rho_o}\right)\cdot |E(2,1)|\cos\left\{3nt-(\varphi_1+\varphi_2)+phE(2,1)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_4}{4n\rho_o}\right)\cdot\left(\frac{M_1}{n\rho_o}\right)\cdot |E(4,-1)|\cos\left\{3nt-(\varphi_4-\varphi_1)+phE(4,-3)\right\} \qquad \ldots 8.36.$$

$$W_4 = \frac{M_4}{4n\rho_o} M''_{10}(\alpha_4)\sin\left\{4nt-\varphi_4+\epsilon''_{10}(\alpha_4)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_o}{4n\rho_o}\right)\left(\frac{M_4}{4n\rho_o}\right)|E(4,0)|\cos\left\{4nt-\varphi_4+phE(4,0)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_1}{n\rho_o}\right)\left(\frac{M_3}{3n\rho_o}\right)|E(3,1)|\cos\left\{4nt-(\varphi_1+\varphi_3)+phE(3,1)\right\}$$

$$- \frac{1}{c_o}\left(\frac{M_2}{2n\rho_o}\right)^2 |E(2,2)|\cos\left\{4nt-2\varphi_2+phE(2,2)\right\} \qquad \ldots 8\text{-}37.$$

As an example of the magnitude of a typical set of corrections, a complete calculation has been done for one of McDonald's experiments on the femoral artery of the dog. Fourier Analysis of his pressure gradient record gave

$$-\frac{\partial p}{\partial z} = 0.159 + 0.774\cos(nt+0^{\circ}39') + 1.317\cos(2nt-82^{\circ}45') - 0.743\cos(3nt+26^{\circ}30') - 0.414\cos(4nt-16^{\circ}39')$$

These coefficients are in mm. of mercury per centimetre. The conversion constant to bring them to absolute units was included in the common factor $1/n\rho_o$. It is not possible to make an accurate estimate of c_o until accurate measurements have been made over short lengths of artery. The author was permitted to examine the film record of this experiment, and made a rough measurement of the maximum arterial expansion on the projected image. This gave a maximum ξ/R of about 6%. Since

$$\left|\frac{2\xi}{R}\right| = \frac{|\bar{w}_1|}{c_o} \quad |X-iY|$$

and the maximum average velocity was 88 $^{m}/_{sec}$, which suggests

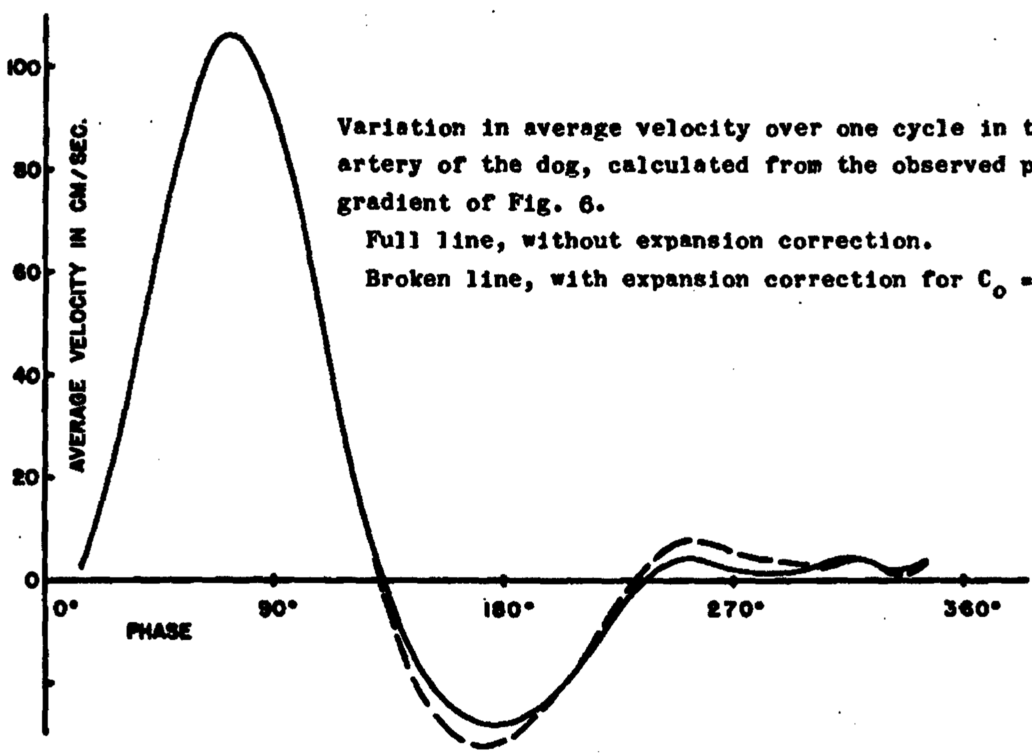
$$600 < c_o < 700 \ ^{cm}/sec.$$

The pulse velocity, estimated from records of other experiments, suggested a value of c_o of about 850 $^{cm}/sec$. Two sets of corrections have, therefore, been calculated, for $c_o=1000$ $^{cm}/_{sec}$ and for $c_o=500$ $^{cm}/sec$. These have been carried out for the limiting condition of stiff constraint only. As may be seen from Fig. 32, the effect is not very marked, even for $c_o=500$. The curve for $c_o=1000$ is not shown. In table 7 the Fourier Coefficients are shown for the uncorrected average velocity and the two sets of corrections.

These results indicate that, particularly during systolic flow, the main effect of the finite expansion on the rate of flow is the factor $1 + \frac{2\xi}{R}$ when multiplying the average velocity by the cross-sectional area.

Table 7A

m	Uncorrected: Coefficient of cos mnt	Uncorrected: Coefficient of sin mnt	c_o = 1000: Coefficient of cos mnt	c_o = 1000: Coefficient of sin mnt	c_o = 500: Coefficient of cos mnt	c_o = 500: Coefficient of sin mnt
1	+19.08	+33.14	20.01	32.44	20.94	31.75
2	-31.78	+14.89	-32.57	15.57	-33.37	16.25
3	- 8.79	-10.58	- 8.47	-10.69	- 8.16	-10.79
4	- 0.44	- 5.86	- 0.15	- 5.73	0.14	- 5.47



Variation in average velocity over one cycle in the femoral artery of the dog, calculated from the observed pressure gradient of Fig. 6.

Full line, without expansion correction.

Broken line, with expansion correction for C_o = 500 cm-per sec.

FIG. 32

SECTION IX

THE FIRST-ORDER PERTURBATION CORRECTION FOR THE QUADRATIC TERMS IN THE EQUATIONS OF VISCOUS FLUID MOTION

The correction for the quadratic terms in the Navier-Stokes equations follows the same pattern as the correction for finite expansion, with one important difference. If the same forms for p and w are substituted in the equation for the longitudinal velocity,

$$\frac{\partial^2 w}{\partial y^2} + \frac{1}{y}\frac{\partial w}{\partial y} - \frac{R^2}{\nu}\frac{\partial w}{\partial t} = \frac{R^2}{\mu}\frac{\partial p}{\partial z} + \frac{R}{\nu} u \frac{\partial w}{\partial y} + \frac{R^2}{\nu} w \frac{\partial w}{\partial z} \qquad 9.1$$

and a solution is sought along the same lines as in the previous section, it is found that the functions on the right-hand side of the resulting equations are (since they contain quadratic terms in the velocity components) products of three Bessel Functions, and when an attempt is made to solve these by the method of Variation of Parameters, the resulting quadratures involve products of three Bessel Functions, which do not reduce to known forms. To find the average velocity across the tube requires a further quadrature, and the amount of numerical integration required is, at first sight, quite formidable.

As the main objective is to find the effect of these terms on the average velocity, there is an obvious advantage in seeking a method that will give the average velocity directly, without the calculation of the velocity profile across the tube. This can be done by using the quantity

$$q = \int_0^y w \cdot 2y \cdot dy \qquad 9.2$$

which is, in effect, the Stokes stream function of the motion. Before deriving the detailed equations from 8.1 we prove a general result which will be required for their solution. Consider the equation

$$\frac{d^2 w}{dy^2} + \frac{1}{y}\frac{dw}{dy} + 1^3\alpha^2 w = f(y) \qquad 9.3$$

in which f(y) is a known function of y. The corresponding equation for q is

$$\frac{d^2 q}{dy^2} - \frac{1}{y}\frac{dq}{dy} + 1^8\alpha^2 q = g(y) \qquad 9.4$$

in which $g(y) = \int_0^y f(y) \cdot 2y \cdot dy$

The solution of 9.4 which is zero at $y = 0$ is

$$q = AyJ_1(\alpha y i^{3/2}) + yJ_1(\alpha y i^{3/2}) \int_0^y \frac{dy}{y\left\{J_1(\alpha y i^{3/2})\right\}^2} \int_0^y g(y) \cdot J_1(\alpha y i^{3/2})\, dy \qquad 9.5$$

Since $w = 0$ at $y = 1$ the equation to determine A is $\frac{dq}{dy} = 0$ at $y = 1$ 9.6

Differentiating 9.5 and inserting $y = 1$, the equation for A is

$$0 = A\alpha i^{3/2} J_0(\alpha i^{3/2}) + \alpha i^{3/2} J_0(\alpha i^{3/2}) \int_0^1 \frac{dy}{y\left[J_1(\alpha y i^{3/2})\right]^2} \int_0^y g(y) J_1(\alpha y i^{3/2})\, dy$$

$$+ \frac{1}{J_1(\alpha i^{3/2})} \int_0^1 g(y) \cdot J_1(\alpha y i^{3/2}) \cdot dy \qquad 9.7$$

so that

$$q = -\, yJ_1(\alpha y i^{3/2}) \int_y^1 \frac{dy}{y\; J_1(\alpha y i^{3/2})^2} \int_0^y g(y) J_1(\alpha y i^{3/2})\, dy$$

$$- \frac{yJ_1(\alpha y i^{3/2})}{\alpha i^{3/2} J_0(\alpha i^{3/2}) \cdot J_1(\alpha i^{3/2})} \int_0^1 g(y) J_1(\alpha y i^{3/2})\, dy \qquad 9.8$$

and when $y = 1$ this reduces to

$$[q]_{y=1} = \frac{-1}{\alpha i^{3/2} J_0(\alpha i^{3/2})} \int_0^1 g(y)\; J_1(\alpha y i^{3/2})\, dy \qquad 9.9$$

This can be put into a more convenient form by a single integration by parts. It then becomes

$$[q]_{y=1} = \frac{1}{i^3 \alpha^2} \int_0^1 \left\{1 - \frac{J_0(\alpha y i^{3/2})}{J_0(\alpha i^{3/2})}\right\} f(y) \cdot 2y \cdot dy \qquad 9.10$$

The determination of the correction to the average velocity is therefore reduced to a single quadrature. Moreover the function which multiplies $f(y)$ is that which has already been calculated in finding the velocity profile for the rigid tube.

Returning to 9.1 and inserting the following expressions for $\frac{\partial p}{\partial z}$, w and u,

$$-\frac{\partial p}{\partial z} = A_0 + A_1 \exp\left\{in(t - z/c_1)\right\} + A_1^* \exp\left\{-in(t - z/c_1^*)\right\} + \;\ldots\ldots$$

$$+ A_m \exp\left\{imn(t - z/c_m)\right\} + A_m^* \exp\left\{imn(t - z/c_m^*)\right\} + \ldots$$

$$w = w_o + w_1 \exp\left\{in(t-z/c_1)\right\} + w_1^* \exp\left\{-in(t-z/c_1^*)\right\} \cdots$$

$$\cdots + w_m \exp\left\{imn(t-z/c_m)\right\} + w_m^* \exp\left\{-imn(t-z/c_m^*)\right\}$$

$$u = u_1 \exp\left\{in(t-z/c_1)\right\} + u_1^* \exp\left\{-in(t-z/c_1^*)\right\} + \cdots$$

$$\cdots + u_m \exp\left\{imn(t-z/c_m)\right\} + u_m^* \exp\left\{-imn(t-z/c_m^*)\right\} + \cdots$$

where c_m is the complex wave-velocity of the m^{th} harmonic, the equations for the w_0, w_1 .... become, after collecting up powers of e^{int},

$$\frac{d^2 w_o}{dy} + \frac{1}{y}\frac{dw_o}{dy} = -\frac{A_o R^2}{\mu} + \frac{1}{c_o}\frac{R^2}{\nu}\sum_m \left\{\frac{c_o u_m}{R}\frac{dw_m^*}{dy} + \frac{c_o u_m^*}{R}\frac{dw_m}{dy}\right\} \qquad 9.11$$

$$\frac{d^2 w_1}{dy^2} + \frac{1}{y}\frac{dw_1}{dy} + 1^s\alpha^2 w_1$$

$$= -\frac{A_1 R^2}{\mu} + \frac{1}{c_o}\frac{R^2}{\nu}\sum_m \left\{\frac{c_o u_m}{R}\frac{dw_{m-1}^*}{dy} + \frac{c_o u_{m-1}^*}{R}\frac{dw_m}{dy}\right\}$$

$$-\frac{i\alpha^2}{c_o}\sum_m \left\{\frac{mc_o}{c_m} - \frac{(m-1)c_o}{c_m^*}\right\} w_m w_{m-1}^* \qquad 9.12$$

and similarly for the other harmonics.

As with the expansion correction, if the known forms for w_m and u_m are inserted on the right-hand sides of these equations, they have become linear, and the effects of the interactions between the harmonics can be treated separately. We now write down the equations for these individual interactions. There are four different forms to be considered.

1. The effect of the mth harmonic on the steady flow. The equation for this is

$$\frac{1}{y}\frac{d}{dy}\left(y\frac{dw}{dy}\right) = \frac{1}{c_o}\frac{R^2}{\nu}\left\{\frac{c_o u_m}{R}\frac{dw_m^*}{dy} + \frac{c_o u_m^*}{R}\cdot\frac{dw_m}{dy}\right\} \qquad 9.13$$

in which

$$\frac{u_m}{R} = \frac{A_m}{imn\rho}\cdot\frac{imn}{2c_m}\left\{y + \eta_m\frac{2J_1(\alpha_m y i^{3/2})}{\alpha_m' i^{3/2} J_0(\alpha_m i^{3/2})}\right\}$$

Ref. 6.5, 3.20, 3.21

$$\frac{u_m^*}{R} = \frac{A_m^*}{-imn\rho}\cdot\frac{-imn}{2c_m^*}\left\{y + \eta_m^*\frac{2J_1(\alpha_m y i^{-3/2})}{\alpha_m i^{-3/2} J_0(\alpha_m i^{-3/2})}\right\}$$

$$\frac{dw_m}{dy} = \frac{A_m}{imn\rho}\cdot\left\{-\eta_m\cdot\alpha_m i^{3/2}\cdot\frac{J_1(\alpha_m y i^{3/2})}{J_0(\alpha_m i^{3/2})}\right\}$$

$$\frac{dw_m^*}{dy} = \frac{A_m^*}{-imn\rho}\left\{-\eta_m^*\cdot\alpha_m i^{-3/2}\cdot\frac{J_1(\alpha_m y i^{-3/2})}{J_0(\alpha_m i^{-3/2})}\right\}$$

so that the right-hand side of 9.13 becomes

$$\frac{i\alpha_m^2}{c_o}\left(\frac{A_m A_m^*}{m^2n^2\rho^2}\right)\frac{c_o}{c_m^*}\left\{\frac{y}{2} + \eta_m^*\frac{J_1(\alpha_m y i^{-3/2})}{\alpha\, i^{-3/2} J_0(\alpha\, i^{-3/2})}\right\}\cdot(\eta_m^*)\cdot\frac{\alpha_m i^{3/2} J_1(\alpha_m u^{3/2})}{J_0(\alpha\, i^{3/2})}$$

$$\frac{-i\alpha_m^2}{c_o}\left(\frac{A_m A_m^*}{m^2n^2\rho^2}\right)\frac{c_o}{c_m}\left\{\frac{y}{2} + \eta_m\frac{J_1(\alpha_m y i^{3/2})}{\alpha_m i^{3/2} J_0(\alpha_m i^{3/2})}\right\}(\eta_m^*)\cdot\frac{\alpha_m i^{-3/2} J_1(\alpha_m y i^{-3/2})}{J_0(\alpha_m\, {}^{-3/2})}$$

If now we define the standard correction function as being such that the effect of the m^{th} harmonic on the steady flow is

$$\frac{1}{c_o}\left(\frac{M_m}{mn\rho}^2\right)w(m,-m)$$

Then

$$W(m,-m) = \frac{1}{4}\int_0^1 w\cdot 2y\cdot dy \qquad 9.14$$

in which w is the solution of the equation

$$\frac{1}{y}\frac{d}{dy}\left(y\frac{dw}{dy}\right) = \frac{i\alpha_m^2}{2}\frac{c_o}{c^*}\quad\eta_m\alpha_m i^{3/2}y\,\frac{J_1(\alpha_m i^{3/2}y)}{J_0(\alpha_m i^{3/2})}$$

$$-\frac{i\alpha_m^2}{2}\frac{c_o}{c}\cdot\eta_m^*\alpha_m i^{-3/2}y\cdot\frac{J_1(\alpha_m i^{-3/2}y)}{J_0(\alpha_m i^{-3/2})}\cdot$$

$$+2\alpha^2\left(\frac{c_o}{c}\right)_{re}\cdot|\eta_m^2|\cdot\frac{J_1(\alpha_m i^{3/2}y)\cdot J_0(\alpha_m i^{-3/2}y)}{J_0(\alpha_m i^{3/2})\cdot J_0(\alpha_m i^{-3/2})}$$

9.15

Multiplying 9.15 by y and integrating from zero to y,

$$y\frac{dw}{dy} = \frac{i\alpha_m^2}{2}\frac{c_0}{c_m^*}\cdot\eta_m y^2\frac{J_2(\alpha_m i^{3/2}y)}{J_0(\alpha_m i^{3/2})} - \frac{i\alpha_m^2}{2}\frac{c_0}{c}\cdot\eta^* y^2\frac{J_2(\alpha_m i^{-3/2}y)}{J_0(\alpha_m i^{-3/2})}$$

$$+ 2\alpha_m^2\left(\frac{c_0}{c_m}\right)_R\cdot|\eta_m^2|\cdot\frac{y}{-2i\alpha_m^2}\cdot\left[i\frac{J_0(\alpha_m i^{-3/2}y)}{J_0(\alpha_m i^{-3/2})}\cdot\frac{d}{dy}\left\{\frac{J_0(\alpha_m i^{3/2}y)}{J_0(\alpha_m i^{3/2})}\right\}\right.$$

$$\left. + i\frac{J_0(\alpha_m i^{3/2})}{J_0(\alpha_m i^{3/2}y)}\cdot\frac{d}{dy}\left\{\frac{J_0(\alpha_m i^{-3/2}y)}{J_0(\alpha_m i^{-3/2})}\right\}\right] \qquad 9.16$$

From the recurrence relation for Bessel Functions,

$$y\frac{J_2(ky)}{J_0(k)} = \frac{2J_1(ky)}{k\,J_0(k)} - \frac{y\,J_0(ky)}{J_0(k)}$$

and therefore 9.16 can be integrated, giving

$$w = \frac{i\alpha_m^2}{2}\frac{c_0}{c_m^*}\cdot\eta_m\cdot\frac{2}{i^3\alpha_m^2}\left\{1 - \frac{J_0(\alpha_m i^{3/2}y)}{J_0(\alpha_m i^{3/2})}\right\}$$

$$+ \frac{i\alpha^2}{2}\cdot\frac{c_0}{c_m^*}\cdot\eta_m\left\{\frac{1}{\alpha_m i^{3/2}}\cdot\frac{J_1(\alpha_m i^{3/2})}{J_0(\alpha_m i^{3/2})} - \frac{y}{\alpha_m i^{3/2}}\cdot\frac{J_1(\alpha_m i^{3/2}y)}{J_0(\alpha_m i^{3/2})}\right\}$$

together with its complex conjugate and

$$+ \left(\frac{c_0}{c}\right)_{re}\cdot|\eta_m^2|\cdot\left\{1 - \frac{J_0(\alpha_m i^{3/2}y)\,J_0(\alpha_m i^{-3/2}y)}{J_0(\alpha_m i^{3/2})\,J_0(\alpha_m i^{-3/2})}\right\} \qquad 9.17$$

Integrating again to obtain the average velocity,

$$W(m,-m) = -\frac{1}{4}(-\eta)\cdot\frac{c_0}{c^*}M_{10}'\,e^{i\varepsilon_{10}'} + \frac{i\alpha^2}{8}\left(\frac{c_0}{c^*}\right)\eta\cdot\frac{1}{\alpha i^{3/2}}\frac{J_0(\alpha i^{3/2})}{J_0(\alpha i^{3/2})}$$

$$-\frac{i\alpha^2}{4}\frac{c_0}{c^*}\cdot\eta\cdot\frac{1}{i^3\alpha^2}\frac{J_2(\alpha i^{3/2})}{J_0(\alpha i^{3/2})}$$

together with its conjugate and

$$\frac{1}{4}\cdot\left(\frac{c_0}{c}\right)_{re}\cdot|\eta|^2\cdot\left\{1 - \frac{2J_1(\alpha i^{3/2})}{\alpha i^{3/2}J_0(\alpha i^{3/2})}\right\}_{re} \qquad 9.18$$

This last result follows from the example given in McLachlan's "Bessel Functions for Engineers" Ch VII, Page 146 (Second Edition, 1955).

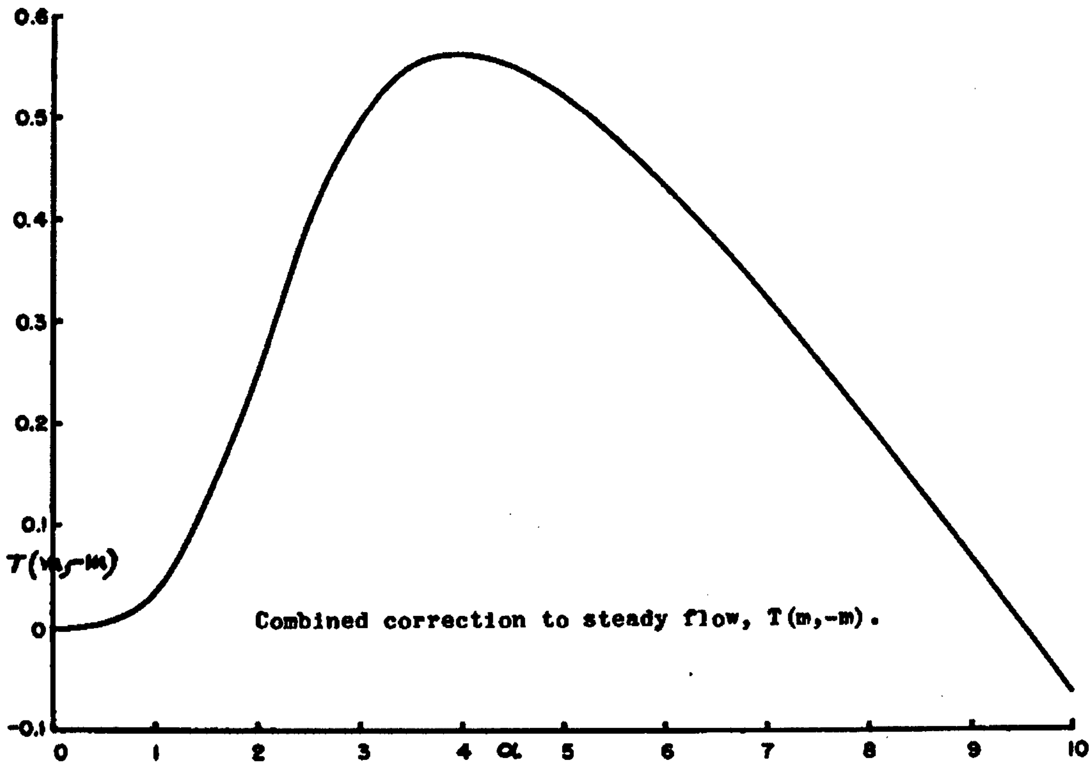
We have, therefore,

$$W(m,-m) = \frac{1}{2}(-\eta)\cdot\frac{c_0}{c^*}\cdot M'_{10}\, e^{i\varepsilon'_{10}} + \frac{1}{2}(-\eta^*)\frac{c_0}{c}M'_{10}\, e^{-i\varepsilon'_{10}} + \frac{1}{4}\left(\frac{c_0}{c}\right)_{re} |\eta^2| \cdot M'_{10}\cos\varepsilon'_{10} + \frac{i\alpha^2}{8}\left(\frac{c_0}{c}\cdot\right)\eta^*\cdot\frac{1}{2}\left(1 - M'_{10}e^{i\varepsilon'_{10}}\right) - \frac{i\alpha^2}{8}\frac{c_0}{c}\cdot\eta^*\cdot\frac{1}{2}\left(1 - M'_{10}e^{-i\varepsilon'_{10}}\right) \qquad 9.19$$

In the limiting condition of stiff constraint this reduces to

$$W(m,-m) = \frac{\sqrt{3}}{2}(M'_{10})^{\frac{1}{2}}\cos\frac{3\varepsilon'_{10}}{2} + \frac{\sqrt{3}}{8}(M'_{10})^{\frac{1}{2}}\cos\frac{\varepsilon'_{10}}{2}\cos\varepsilon'_{10} + \left(\frac{\alpha^2}{8M_{10}}\right)\cdot\frac{\sqrt{3}}{2}\left\{(M_{10})^{\frac{1}{2}}\sin\frac{\varepsilon_{10}}{2} - (M'_{10})^{\frac{3}{2}}\sin\frac{3\varepsilon'_{10}}{2}\right\}$$

9·20



Combined correction to steady flow, T(m,-m).

FIG. 33

As written, this is in the same direction as the steady stream. The combined effect of this correction and that due to finite expansion is

$$T(m,-m) = \frac{\sqrt{3}}{2}(M'_{10})^{\frac{1}{2}} \left[\cos \frac{3}{2}\varepsilon'_{10} + \frac{1}{4} \cos \varepsilon'_{10} \cos \frac{\varepsilon'_{10}}{2} + \frac{1}{2} M'_{10} \cos \frac{\varepsilon'_{10}}{2} + \frac{\alpha^2}{8M_{10}} \left(\sin \frac{\varepsilon'_{10}}{2} - M'_{10} \sin \frac{3\varepsilon'_{10}}{2}\right)\right] \qquad 9.21$$

A graph of $T(m,-m)$ as a function of α is shown in Fig. 33. It will be seen from this that the steady flow is augmented for all values of α less than 10, but that as α increases further the effect of inertia is dominant and the steady flow is hindered by the presence of the oscillatory terms. The amount of this combined correction for the results of McDonald already quoted, is given below: c_o is taken to be 10 metres/sec. ?-14

m	$\frac{1}{c_o}\left(\frac{M}{mn\rho}\right)^2$	T	Contribution to $\bar{w}_o$
1	2.696	0.537	1.448
2	0.488	0.539	0.263
3	0.031	0.455	0.014
4	0.00003		-
			1.725 cm/sec-

In McDonald's experiment the measured steady term was 15 cm/sec, so that this correction is about 12%, and by no means negligible.

11.5%

2. The effect on the m^{th} harmonic of its own interaction with the steady flow. The equation for this interaction is

$$\frac{d^2w}{dy^2} + \frac{1}{y}\frac{dw}{dy} + i^3\alpha_m w = \frac{1}{c_o}\frac{R^2}{\nu}\frac{c_o u_m}{R} \cdot \frac{dw_o}{dy} - \frac{i\alpha_m^2}{c_o} \cdot \frac{c_o}{c_m} \cdot w_o w_m \qquad 9.22$$

so that the equation for the standard correction function is

$$\frac{d^2w}{dy^2} + \frac{1}{y}\frac{dw}{dy} + i^3\alpha_m^2 w = -\alpha^2_m \frac{c_o}{c_m}\left\{ y^2 + \eta_m \cdot \frac{2yJ_1(\alpha_m y i^{3/2})}{\alpha_m i^{3/2} J_o(\alpha_m i^{3/2})} \right\}$$

$$- \alpha^2_m \frac{c_o}{c_m}\left\{ 1 + \eta_m \frac{J_o(\alpha_m y i^{3/2})}{J_o(\alpha_m i^{3/2})} \right\} (1-y^2) \qquad 9.23$$

Solving this by 9.10, the standard correction function is

$$W(m,o) = -i\frac{c_o}{c_m}\int_0^1 \left\{1 - \frac{J_o(\alpha_m y i^{3/2})}{J_o(\alpha_m i^{3/2})}\right\}\left\{y^2 + \eta_m \frac{2yJ_1(\alpha_m y i^{3/2})}{\alpha_m i^{3/2} J_o(\alpha_m i^{3/2})}\right\} 2ydy$$

$$- i\frac{c_o}{c_m}\int_0^1 \left\{1 - \frac{J_o(\alpha_m y i^{3/2})}{J_o(\alpha_m i^{3/2})}\right\}\left\{1 + \eta \frac{J_o(\alpha_m i^{3/2})}{J_o(\alpha_m i^{3/2})}\right\}(1-y^2)\, 2ydy \qquad 9.24$$

All the terms in these two integrals can be expressed in terms of $J_o(\alpha i^{3/2})$ and $J_1(\alpha i^{3/2})$.

The necessary reduction formulae can be found in Watson: "Theory of Bessel Functions" Ch. V. It is, however, simpler and quicker to evaluate them by direct numerical integration.

For the pressure gradient in real form, this $W(m,o)$ must be combined with its conjugate, in the same manner as was done for the expansion correction. Thus, the complete interaction term will be, for the m^{th} harmonic.

$$\frac{1}{c_o}\left(\frac{M_o R^2}{4\mu}\right)\left(\frac{M_m}{mne}\right)|W(m,o)|\cos\left\{mnt - \varphi_m + phW(m,o)\right\} \qquad 9.25$$

3. The effect on the $(k-m)^{th}$ harmonic of the interaction between the k^{th} and m^{th} harmonics.

The equation for this is.

$$\frac{d^2w}{dy^2} + \frac{1}{y}\frac{dw}{dy} + i^3\alpha_{k-m}^2 w = \frac{1}{c_0\nu}\frac{R^2}{}\left\{\frac{c_0 u_k}{R}\cdot\frac{dw_m^*}{dy} + \frac{c_0 u_m^*}{R}\cdot\frac{dw_k}{dy}\right\}$$

$$- \frac{i\alpha^2}{c_0}\left\{\frac{kc_0}{c_k} - \frac{mc_0}{c_m^*}\right\} w_k w_m^* \qquad 9.26$$

so that in the equation for the standard correction function the right-hand side is

$$i\alpha_k^2\cdot\frac{c_0}{c_k}\cdot\left\{\frac{y}{2} + \eta_k\cdot\frac{J_1(\alpha_k i^{3/2}y)}{\alpha_k i^{3/2}J_0(\alpha_k i^{3/2})}\right\}(-\eta_m^*)\cdot\alpha_m i^{-3/2}\frac{J_1(\alpha_m i^{-3/2}y)}{J_0(\alpha_m i^{-3/2})}$$

$$-i\alpha_m^2\cdot\frac{c_0}{c_m^*}\left\{\frac{y}{2} + \eta_m^*\frac{J_1(\alpha_m i^{-3/2}y)}{\alpha_m i^{-3/2}J_0(\alpha_m i^{-3/2})}\right\}(-\eta_k)\cdot\alpha_k i^{3/2}\cdot\frac{J_1(\alpha_k i^{3/2}y)}{J_0(\alpha_k i^{-3/2})}$$

$$- i\alpha^2\left\{\frac{kc_0}{c_k} - \frac{mc_0}{c_m^*}\right\}\left\{1 + \eta_k\frac{J_0(\alpha_k i^{3/2}y)}{J_0(\alpha_k i^{3/2})}\right\}\left\{1 + \eta_m^*\frac{J_0(\alpha_m i^{-3/2}y)}{J_0(\alpha_m i^{-3/2})}\right\} \qquad 9.27$$

and the standard correction function is obtained from this by the use of 9.10.

For the limiting condition of stiff constraint the result is

$$W(k,-m) =$$

$$-\frac{k}{k-m}\int_0^1 \left(\frac{3}{4}\,\frac{e^{-i\varepsilon'_{10}(\alpha_k)}}{M'_{10}(\alpha_k)}\right)^{\frac{1}{2}} \cdot \left\{\frac{y}{2} - \frac{J_1(\alpha_k i^{s/2} y)}{\alpha_k i^{s/2}\, J_0(\alpha_k i^{s/2})}\right\} \alpha_m i^{-s/2} \cdot \frac{J_1(\alpha_m i^{-s/2} y)}{J_0(\alpha_{k-m} i^{s/2})} \cdot \left\{1 - \frac{J_0(\alpha_{k-m} y i^{s/2})}{J_0(\alpha_{k-m} i^{s/2})}\right\} 2y\,dy$$

$$+\frac{m}{k-m}\int_0^1 \left(\frac{3}{4}\cdot\frac{e^{+i\varepsilon'_{10}(\alpha_m)}}{M'_{10}(\alpha\ )}\right)^{\frac{1}{2}} \cdot \left\{\frac{y}{2} - \frac{J_1(\alpha_m i^{-s/2} y)}{\alpha_m i^{-s/2} J_0(\alpha_m i^{-s/2})}\right\} \alpha_k i^{+s/2} \cdot \frac{J_1(\alpha_k i^{s/2} y)}{J_0(\alpha_k i^{s/2})} \cdot \left\{1 - \frac{J_0(\alpha_{k-m} y i^{s/2})}{J_0(\alpha_{k-m} i^{s/2})}\right\} 2y\,dy$$

$$+\frac{1}{k-m}\left\{k\left(\frac{3}{4}\,\frac{e^{-\varepsilon'_{10}(\alpha_k)}}{M'_{10}(\alpha_k)}\right)^{\frac{1}{2}} - m\left(\frac{3}{4}\cdot\frac{e^{i\varepsilon'_{10}(\alpha_m)}}{M'_{10}(\alpha_m)}\right)^{\frac{1}{2}}\right\}\int_0^1 \left\{1 - \frac{J_0(\alpha_k i^{s/2} y)}{J_0(\alpha_k i^{s/2})}\right\}\left\{1 - \frac{J_0(\alpha_m i^{-s/2} y)}{J_0(\alpha_m i^{-s/2})}\right\}\left\{1 - \frac{J_0(\alpha_{k-m} i^{s/2} y)}{J_0(\alpha_{k-m} i^{s/2})}\right\} 2y\,dy$$

When the $W(k,m)$ are known, the expressions for the corrected components of the average velocity can be written down, being similar in form to equations 8.34 - 8.37 with the $W(k,m)$ taking the place of the $E(k,m)$. The coefficients multiplying the $W(k,m)$ in these expressions will be the same as those multiplying the $E(k,m)$ in equations 8.34 - 8.37, except for the $W(m,o)$ which will be as shown in 9.25. Except for the interaction with the steady flow, therefore, the $E(k,m)$ and the $W(k,m)$ can be combined into a single standard correction-function $T(k,m)$. The question of the preparation of tables of $T(k,m)$ over a full range of values of α up to the fourth harmonic is at present being considered.

In order to make an estimate of the magnitude of the correction for the same experimental results as in Section VIII, the values of the $W(k,m)$ for $\alpha = 3.34$, k and $m \leq 4$ were calculated by numerical quadrature. The computations were performed on the 1103 computer in the Computation Branch, Aeronautical Research Laboratory, being programmed and supervised by Lt L. O'Dell, USAF.

Table 7B

Values of $W(k,m)$ for $\alpha = 3.34$

k,m	W_{re}	W_{im}	$\lvert W \rvert$	phW
1,0	0.6745	-0.4100	0.7893	$-31^{o}.29$
2,0	0.4986	-0.6424	0.8132	$-52^{o}.18$
3,0	0.3961	-0.7106	0.8135	$-60^{o}.86$
4,0	0.3369	-0.7423	0.8152	$-65^{o}.59$
1,1	0.0966	0.3030	0.3180	$72^{o}.32$
2,1	0.3130	0.6453	0.7172	$64^{o}.12$
3,1	0.3110	0.6575	0.7273	$64^{o}.69$
2,-1	0.2495	0.9197	0.9529	$74^{o}.82$
3,-1	0.2782	0.4594	0.5371	$58^{o}.80$
4,-1	0.2870	0.2381	0.3729	$39^{o}.68$
3,-2	0.1450	1.4288	1.4361	$84^{o}.20$
4,-2	0.3032	0.9189	0.9676	$71^{o}.74$
4,-3	0.0261	1.7606	1-7608	$90^{o}.85$
2, 2	0.2392	0.2256	0.3288	$43^{o}.32$

The trapezoidal rule was used for integration, one hundred ordinates being taken in the range $0 \le y \le 1$. The values of the W(k,m) are given in Table 7A.

These values of the W(k,m) were substituted in the expressions for the velocity components (i.e. those corresponding to 8.34 - 8.37 above) together with the components of McDonald's observed pressure gradient. The resulting values for the coefficients in the Fourier Series for the average velocity are given in Table 7B together with the values of the coefficients when this correction, and that for finite expansion, are combined.

Table 7C

Harmonic	Quadratic Term Correction only. Coefft of		Combined Correction Coefft of	
	cos mnt	sin mnt	cos mnt	sin mnt
1	22.51	33.94	24.37	32.55
2	- 31.56	13.92	- 33.15	15.28
3	- 7.35	- 10.15	- 6.72	- 10.36
4	- 0.94	- 5.34	- 0.36	- 4.95

The average (across x-section) velocity, with the combined correction, is shown in Fig. 34. The full line shows the uncorrected average velocity, and the discrete points are the values of the corrected average velocity, plotted at intervals of 15°. The correction increases the predicted value of the systolic peak by about 5%, and predicts greater backflow. The differences between the corrected and uncorrected values are small, never being more than 7 cm. per second, and since these corrections are exaggerated, the value of c_0 (= 500 cm/sec.) taken being about two-thirds of its value, these non-linear corrections would seem to be an unnecessary refinement.

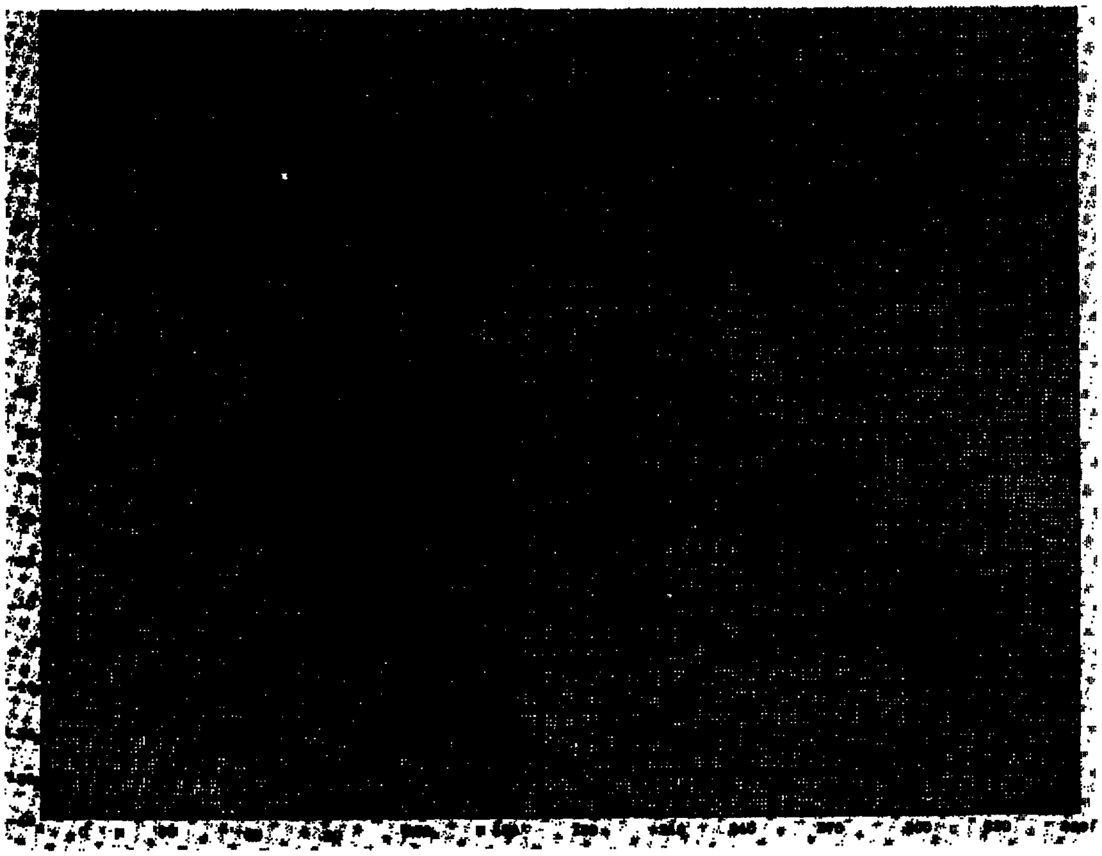


FIG 34

Variation in average velocity over one cycle in the femoral artery of the dog, calculated from the observed pressure gradient of Fig. 6. Full line - without non-linear corrections. Isolated points, with combined correction for $C_0 = 500$ cm/sec.

SECTION X

THE "EXACT" SOLUTION FOR OSCILLATORY MOTION IN THE PRESENCE OF A STEADY STREAM

Whilst the perturbation method is the obvious first step toward taking account of deviations from linearity in a system which is approximately linear, it is always desirable to have an exact solution, if one can be obtained, in a practical and usable form. It is shown below that the exact solution for the interaction between a sinusoidal oscillation and a steady stream can be derived in terms of a Confluent Hypergeometric Function of complex argument. This function has never been tabulated, and to study the implications of this exact solution on the motion of the liquid, the wave-velocity, and on the perturbation formulae of the previous section, requires an elaborate program of computation which is at present under consideration. It is possible, however, to derive some close approximations in terms of Bessel Functions when the velocity of the steady stream is small compared with the wave-velocity, and these are discussed in some detail.

An approximate solution of this problem, when the amplitude of the oscillation is small compared with the steady stream, has been given by Morgan and Ferrante (1955), who by a close-reasoned physical argument, based on a critical study of the magnitudes of the quantities involved, derived simple formulae for the wave-velocity which they compared with some experimental results obtained by Müller. As in the earlier paper (Morgan and Kiely 1954) the motion of the liquid is not discussed at all.

In the great arteries, however, the oscillatory terms are at least as large as, and very often considerably larger than, the steady stream, and the assumptions made by Morgan and Ferrante do not apply. It is very desirable, therefore, that the "exact" solution be studied. The solution given below is called "exact" in quotation marks because it omits the generation of higher harmonics, assuming that they can be accounted for by perturbation theory. The approximations in terms of Bessel Functions which are given depend for their validity only on the smallness of the steady stream velocity in relation to the velocity of wave-propagation, and not on the relative magnitudes of the velocities of the steady and oscillatory streams. We assume

$$-\frac{\partial p}{\partial z} = A_0 + A_1 e^{in(t-z/c)} \qquad 10{\cdot}1$$

$$w = w_0 + w_1 e^{in(t-z/c)} \qquad 10{\cdot}2$$

$$u = u_0 + u_1 e^{in(t-z/c)} \qquad 10{\cdot}3$$

From the equation of continuity

$$u_1 y = \frac{inR}{2c} q_1 \tag{10.4}$$

where q_1 has the same meaning as in the previous section, i.e.,

$$q_1 = \int_0^y w_1 \cdot 2y \cdot dy \tag{10.5}$$

Now
$$w_0 = \frac{A_0 R^2}{4\mu}(1 - y^2)$$

$$= 2\,\bar{w}_0(1 - y^2) \tag{10.6}$$

$$\frac{dw_0}{dy} = -4\,\bar{w}_0\, y \tag{10.7}$$

and
$$u_0 = 0$$

Substituting these in the equation for the longitudinal velocity, 9.1, we have

$$\frac{d^2w_1}{dy^2} + \frac{1}{y}\frac{dw_1}{dy} + i^3\alpha^2 w_1 = -\frac{A_1R^2}{\mu} - i\alpha^2 \cdot \frac{2\bar{w}_0}{c} q_1 - i\alpha^2\frac{2\bar{w}_0}{c}(1-y^2)w_1 \tag{10.8}$$

Now write $b^2 = 2\bar{w}_0/c$, the ratio of the axial velocity of the steady motion to the wave-velocity. The equation then becomes

$$\frac{d^2w_1}{dy^2} + \frac{1}{y}\frac{dw_1}{dy} + i^3\alpha^2 w_1 = -\frac{A_1R^2}{\mu} - i\alpha^2b^2\int_0^y w_1\, 2y dy - i\alpha^2b^2w_1(1-y^2) \tag{10.9}$$

If the second term on the right-hand side of 10.9 is integrated by parts the equation becomes

$$\frac{d^2w}{dy^2} + \frac{1}{y}\frac{dw_1}{dy} + i^3\alpha^2(1-b^2)w_1 + i^3\alpha^2b^2\int_0^y y^2\frac{dw_1}{dy}dy = -\frac{A_1R^2}{\mu} \tag{10.10}$$

A Particular Integral of this equation is

$$\frac{A_1R^2}{i\mu\alpha^2(1-b^2)}$$

and the complete solution of 10.10 will be the sum of this and the solution of 10.10 with the right-hand side zero. Changing the independent variable to

$$x = b\alpha i^{\frac{1}{2}} y^2$$

and defining γ as

$$\gamma = b\alpha i^{\frac{1}{2}}\left(\frac{1}{b^2} - 1\right)$$

this becomes

$$4\,\frac{d}{dx}\left(x\,\frac{dw_1}{dx}\right) - \gamma w_1 - \int_0^x x\,\frac{dw_1}{dx}\,dx = 0 \qquad 10\cdot11$$

If 10.11 is differentiated throughout, and v written for $x\frac{dw_1}{dx}$ it becomes

$$\frac{d^2v}{dx^2} + \left\{-\frac{1}{4} - \frac{\gamma}{4x}\right\}v = 0 \qquad 10\cdot12$$

which is Whittaker's form of the equation for the Confluent Hypergeometric Function. The solution is

$$M_{-\gamma/4,\ 1/2,}(x) = xe^{-x/2}\,{}_1F_1\left(1 + \frac{\gamma}{4},\ 2,\ x\right) \qquad 10\cdot13$$

and therefore

$$\frac{dw_1}{dx} = C_1\,e^{-x/2}\,{}_1F_1\left(1 + \frac{\gamma}{4},\ 2,\ x\right) \qquad 10\cdot14$$

The second solution of 10.12 is not required, since $\frac{dw_1}{dy} = 0$ at $y = 0$. The solution of 10.11 will therefore be

$$w_1 = C_2 + C_1\int_0^x e^{-x/2}\,{}_1F_1\left(1 + \frac{\gamma}{4},\ 2, x\right)dx \qquad 10\cdot15$$

and the value of C_2 must be determined by substitution in 10.11. If this is done, it is found that $C_2 = \frac{4}{\gamma}C_1$. If, therefore, $Z_0(\gamma,x)$ be defined by

$$Z_0(\gamma,x) = \frac{4}{\gamma} + \int_0^x e^{-x/2}\,{}_1F_1\left(1 + \frac{\gamma}{4},\ 2,\ x\right)dx \qquad 10\cdot16$$

the solution of 10.10 which satisfies the boundary- condition $w_1 = 0$ at $y = 1$ is

$$w_1 = \frac{A R^2}{i\mu\alpha^2(1 - b^2)}\cdot\left\{1 - \frac{Z_0(\gamma,x)}{Z_0(\gamma,b\alpha i^{1/2})}\right\} \qquad 10\cdot17$$

The average velocity is given by

$$\bar{w}_1 = \frac{1}{b\alpha i^{1/2}}\int_0^{b\alpha i^{1/2}} w_1\,dx$$

and therefore

$$\bar{w}_1 = \frac{A_1R^2}{i\mu\alpha^2(1-b^2)}\left\{1 - \frac{1}{b\alpha i^{\frac{1}{2}}}\int_0^{b\alpha i^{\frac{1}{2}}} \frac{Z_0(\gamma,x)}{Z_0(\gamma,b\alpha i^{\frac{1}{2}})}dx\right\} \qquad 10.18$$

An integration by parts gives the alternative form

$$\bar{w}_1 = \frac{A_1R^2}{i\mu\alpha^2(1-b^2)} \cdot \frac{Z_1(\gamma,\ b\alpha i^{\frac{1}{2}})}{Z_0(\gamma,\ b\alpha i^{-\frac{1}{2}})} \qquad 10.19$$

in which

$$Z_1\ (\gamma,x) = \frac{1}{b\alpha i^{\frac{1}{2}}}\int_0^x xe^{-x/2}\ {}_1F_1(1+\frac{\gamma}{4},\ 2,\ x)dx$$

When $b = 1$, i.e., when the axial velocity of the steady stream is equal to the wave-velocity, these expressions cannot be used. Equation 10.10 reduces to

$$\frac{d^2w_1}{dy^2} + \frac{1}{y}\frac{dw_1}{dy} + i^3\alpha^2\int_0^y y^2\frac{dw_1}{dy}dy = -\frac{A_1R^2}{\mu} \qquad 10.20$$

and a constant value of w_1 is no longer a Particular Integral of this equation.

If, however, instead of $x = b\alpha i^{\frac{1}{2}}y^2$ we write $x = \frac{\alpha i^{3/2}}{2} y^2$ in 10.20, it becomes

$$\frac{d}{dx}\left(x\frac{dw_1}{dx}\right) + \int_0^x x\frac{dw_1}{dx}dx = -\frac{A_1R^2}{2\alpha i^{3/2}\mu} \qquad 10.21$$

Writing $x\frac{dw_1}{dx} = \frac{dV}{dx}$ this becomes

$$\frac{d^2V}{dx^2} + V = -\frac{A_1R^2}{2\alpha i^{3/2}\mu} \qquad 10.22$$

with the initial conditions $V = \frac{dV}{dx} = 0$ at $x = 0$. the solution of which is

$$V = -\frac{A_1R^2}{2\alpha i^{3/2}\mu}(1-\cos x) \qquad 10.23$$

and therefore

$$w_1 = \frac{-A_1R^2}{2\alpha i^{3/2}\mu}\left\{\int_0^{\frac{1}{2}\alpha i^{3/2}}\frac{(1-\cos x)}{x}dx - \int_0^x\frac{(1-\cos x)}{x}dx\right\} \qquad 10.24$$

Integrating this to give the average velocity,

$$\bar{w}_1 = \frac{A_1 R^2}{i\mu\alpha^2}\left\{\frac{\alpha i^{3/2}}{2} - \sin\frac{\alpha i^{3/2}}{2}\right\} \qquad 10.25$$

This remarkably simple result is not likely to have any practical application to arterial flow. The only place where the steady stream velocity could approach half the pulse-velocity would be in the thoracic aorta, where inlet conditions, and possible turbulence, might well nullify the entire theory. Moreover, since c is always complex, the condition $b = 1$ can never exist, except as an approximation when the damping is very small.

It is also desirable to check the limiting form of the solution of 10.12 for $b \longrightarrow 0$, i.e., for $\gamma \longrightarrow \infty$. When γ is large, 10.12 reduces to the Normal Form of Bessel's Equation

$$\frac{d^2 v}{dx^2} - \frac{\gamma v}{4x} = 0 \qquad 10.26$$

with the solution $x^{\frac{1}{2}} J_1\left(i\gamma^{\frac{1}{2}} x^{\frac{1}{2}}\right)$. Rewriting this in terms of y as an independent variable,

$$\frac{dw_1}{dy} = C_1 J_1\left(\sqrt{1 - b^2}\cdot \alpha i^{3/2}\, y\right) \qquad 10.27$$

which reduces to the solution already known for $b = 0$. The simplicity of 10.27 suggests that it may be worth while to examine the range of b over which it would be a reasonable approximation, i.e., for what values of γ, $\frac{\gamma}{4x} >> 1$. The maximum value of x is $b\alpha i^{\frac{3}{2}}$ and therefore this inequality may be replaced by

$$\frac{1}{4}\left(\frac{1}{b^2} - 1\right) >> 1$$

i.e., by

$$\bar{w}_0/c << \frac{1}{10}$$

In the femoral artery McDonald's results give $\bar{w}_0 = 15$ cm/sec. The pulse-velocity is not less than 450 cm/sec. so that for these conditions $\bar{w}_0/c$ is about 1/30. Nearer the heart it is to be expected that $\bar{w}_0$ would be greater, and the pulse-velocity less, so that practical conditions seem, at best, to be beyond the range of usefulness of the approximation. This is unduly pessimistic, for a closer approximation may be obtained very simply by applying the method used in Section IX. If equation 10.10 is written in the form

$$\frac{d^2 w_1}{dy^2} + \frac{1}{y}\frac{dw_1}{dy} + i^3\beta^2 w_1 = -\frac{A_1 R^2}{\mu} - i^3 b^2 \alpha^2 \int_0^y y^2 \frac{dw_1}{dy}\, dy \qquad 10.28$$

in which $\beta^2 = \alpha^2(1-b^2)$, the first approximation

$$w_1 = \frac{A_1R^2}{i\mu\beta^2}\left\{1 - \frac{J_0(\beta i^{3/2}y)}{J_0(\beta i^{3/2})}\right\} \qquad 10.29$$

is obtained at once by dropping the second term on the right-hand side. The first impression is, therefore, that for a small steady stream flowing in the direction of travel of the pulse-wave, the amount of oscillatory flow is increased, and is reduced if the steady stream flows in the opposite direction.

Since $b^2 < 1$, the accuracy of this first approximation can be improved by substituting

$$\frac{dw_1}{dy} = \frac{A_1R^2}{i\mu\beta^2}\cdot\beta i^{3/2}\frac{J_1(\beta i^{3/2}y)}{J_0(\beta i^{3/2})} \qquad 10.30$$

on the right-hand side of 10.28. If we write w_2 for the correction to w_1 arising from this,

$$\frac{d^2w_2}{dy^2} + \frac{1}{y}\frac{dw_2}{dy} + i^3\beta^2w_2^2 = -i^3\alpha^2b^2\cdot\frac{A_1R^2}{i\mu\beta^2}\int_0^y\beta i^{3/2}\cdot\frac{J_1(\beta i^{3/2}y)}{J_0(\beta i^{3/2})}y^2dy$$

$$= \frac{b^2}{1-b^2}\cdot\frac{A_1R^2}{\mu}\left\{y^2\frac{J_2(\beta i^{3/2}y)}{J_0(\beta i^{3/2})}\right\} \qquad 10.31$$

it is not necessary to solve this equation for w_2, since by 9.10, $\bar{w}_2$ can be obtained at once.

$$\bar{w}_2 = \frac{b^2}{1-b^2}\cdot\frac{A_1R^2}{\mu}\cdot\frac{1}{i^3\beta^2}\int_0^1\left\{1 - \frac{J_0(\beta y i^{3/2})}{J_0(\beta i^{3/2})}\right\}y^2\frac{J_2(\beta y i^{3/2})}{J_0(\beta i^{3/2})}\cdot 2y\cdot dy$$

$$10.32$$

$$= \frac{b^2}{1-b^2}\cdot\frac{A\ R^2}{\mu i^3\beta^2}\cdot\frac{2}{\beta i^{3/2}}\cdot\frac{J_3(\beta i^{3/2})}{J_0(\beta i^{3/2})}$$

$$-\frac{b^2}{1-b^2}\cdot\frac{AR^2}{\mu i^3\beta^2}\int_0^1 2y^3\frac{J_2(\beta y i^{3/2})\cdot J_0(\beta y i^{3/2})}{\left\{J_0(\beta i^{3/2})\right\}^2}dy \qquad 10.33$$

From Watson: "Theory of Bessel Functions" Chapter V,

$$\int z^3J_2(z)J_0(z)\,dz = \frac{z^4}{6}\cdot\left\{J_2(z)\ J_0(z) + J_3(z)\ J_1(z)\right\}$$

and, using this result, 10·33 becomes

$$\bar{W}_2 = \frac{b^2}{1-b^2} \cdot \frac{A_1R^2}{i^3\mu\beta^2} \left\{ \frac{2}{\beta i^{3/2}} \cdot \frac{J_3(\beta i^{3/2})}{J_0(\beta i^{3/2})} - \frac{1}{3} \frac{J_2(\beta i^{3/2})}{J_0(\beta i^{3/2})} \frac{1}{3} \cdot \frac{J_1(\beta i^{3/2})}{J_0(\beta i^{3/2})} \cdot \frac{J_3(\beta i^{3/2})}{J_0(\beta i^{3/2})} \right\} \qquad 10{\cdot}34$$

Expressing J_3 in terms of J_2 and J_1 by means of the recurrence formula the expression within the bracket becomes

$$\left\{ \left(\frac{4}{\beta i^{3/2}} \frac{J_2}{J_0} - \frac{J_1}{J_0} \right) \left(\frac{2}{\beta i^{3/2}} - \frac{1}{3} \frac{J_1}{J_0} \right) - \frac{1}{3} \frac{J_2}{J_0} \right\} \qquad 10{\cdot}35$$

and this may be further reduced to

$$- M'_{10} e^{i\varepsilon'_{10}} \left\{ \frac{8}{i^3\beta^2} + \frac{2}{3} M'_{10} e^{i\varepsilon'_{10}} - 2 \right\} - 1 + \frac{1}{3} \left\{ \frac{J_1(\beta i^{3/2})}{J_0(\beta i^{3/2})} \right\}^2 \qquad 10{\cdot}36$$

If there were no damping of the pulse-wave in transmission, c would be real, and the effect of substituting β for α in the Bessel Functions could be calculated from the available tables. Since c is complex, the Bessel Functions are no longer functions of $i^{3/2}$, but of a general complex argument. When $2\bar{W}_0/c$ is small, it is possible to derive an approximation in terms of known functions by using the well-known formula

$$J_n(\lambda z) = \lambda^n \sum_{m=0}^{\infty} J_{n+m}(z) \left[\frac{1-\lambda^2}{2} \cdot z \right]^m \qquad 10{\cdot}37$$

If c_1 is the measured velocity, then

$$\frac{2\bar{W}_0}{c} = \frac{2\bar{W}_0}{c_1} \left\{ 1 - i\frac{Y}{X} \right\}$$

and if β_0 is written for $\sqrt{1 - \frac{2\bar{W}_0}{c_1}}$, then

$$\beta = \beta_0 \sqrt{1 + i \cdot \frac{2\bar{W}_0}{c_1} \cdot \frac{Y}{X}}$$

to first order, and if we write $\lambda^2 = 1 + i\frac{2W_0}{c_1} \cdot \frac{Y}{X}$ in 10·27 above, writing $n = 0$, $n = 1$, in turn, we find that

$$1 - \frac{2\,J_1(\beta i^{3/2})}{\beta i^{3/2} J_0(\beta i^{3/2})} = 1 - \frac{2\,J_1(\beta_0 i^{3/2})}{\beta_0 i^{3/2} J_0(\beta_0 i^{3/2})} + 2i\frac{\bar{W}_0}{c_1} \frac{Y}{X} \left[- M'_{10} e^{i\varepsilon'_{10}} \quad \frac{J_1(\beta_0 i^{3/2})}{J_0(\beta_0 i^{3/2})} \right]^2 \qquad 10{\cdot}38$$

These two expressions, 10.36 and 10.38, can now be brought together to give the average velocity correct to first order in $2\bar{w}_0/_c$. Since 10.36 is itself a first-order correction, it will be sufficiently accurate to write β_0 for β in it. Combining 10.36 and 10.38 the corrected average velocity is

$$\bar{w}_1 + \bar{w}_2 = \frac{A_1 R^2}{i\mu\beta_0^2} \left\{ M'_{10}(\beta_0) e^{i\varepsilon'_{10}(\beta_0)} + \frac{2\bar{w}_o}{c_1} S_{10}(\beta_0) \right\} \tag{10.39}$$

in which $S_{10}(\beta_0)$

$$= 1 + M'_{10} e^{i\varepsilon'_{10}} \left(\frac{8i}{\beta_0^2} + \frac{2}{3} M'_{10} e^{i\varepsilon'_{10}} - 2 \right) - \frac{1}{3} \left\{ \frac{J_1(\beta_0 i^{3/2})}{J_0(\beta_0 i^{3/2})} \right\}^2 - i \tan \frac{\varepsilon_{10}}{2} \left[M_{10} e^{i\varepsilon_{10}} + \left\{ \frac{J_1(\beta_0 i^{3/2})}{J_0(\beta_0 i^{3/2})} \right\}^2 \right] \tag{10.40}$$

Table 8 is a table of $S_{10}(\beta_0)$ for $0 \leq \beta_0 \leq 10$ at intervals of 0.05. The first four columns give the real and imaginary parts, and the modulus and phase, of $S_{10}(\beta_0)$, in that order. The last two columns are the real and imaginary parts of

$$1 - \frac{2J_1(\beta_0 i^{3/2})}{\beta_0 J_0(\beta_0 i^{3/2})} \tag{10.41}$$

i.e., the quantities C_m and D_m of Section II.

For the experimental results of McDonald which have been previously used as an example, the steady component of the average velocity is 15 cm/sec. Only part of this, however, is generated by the steady component of the pressure gradient. As was shown above, in Section IX, 1.7 cm/sec. of this is caused by interactions between the harmonic terms, leaving 13.3 cm/sec. generated by the pressure-gradient.

Taking the pulse velocity to be 450 cm/sec. this gives $2\bar{w}_0/c_1 = 0.06$, $\frac{1}{1-b^2} = \frac{1}{0.94}$.

From a succession of trial values of β_0, therefore, we calculate the real and imaginary parts of

$$\frac{1}{0.94}\left\{1 - F_{10}(\beta_0) + 0.06S_{10}(\beta_{10})\right\}$$

from Table 8, for each of the four harmonics. Using these as our values of C_m and D_m in 2.21, and find the value of β_0 for which the combined oscillatory terms will give equal and opposite to the steady velocity at the observed point of flow reversal, which in this experiment was 125^0. The best fit at this point was given by $\beta_0 = 2.5$, corresponding to $\alpha = 2.58$. The coefficients of the Fourier Series for $\bar{w}$ are given in Table 10 below.

Harmonic	Coeff. of cos nt	Coeff. of sin nt
1	21.81	20.74
2	- 25.97	18.81
3	--9.73	- 8.66
4	- 0.28	- 3.18

A graph of this is shown in Fig. 34, where it is compared with McDonald's observed values. The ordinates in Fig. 34are in flow units, obtained by multiplying the coefficients in Table 9 by the cross- sectional area, the value of R taken being the same as that assumed by McDonald, i.e., 1.5 mm. The fit to the observations is not improved much by using the "exact" solution. Except for a slight increase in diastolic flow, as good a fit can be obtained by using the simple theory with $\alpha = 2.7$. (Fig. 34).

If the approximate solution for $\bar{w}$ given in 10.40 were to be substituted in the "frequency equation" 3.31, the reduced determinant would become

$$\begin{vmatrix} 1 - \psi_{10}(\beta_0) & 2 & 1 \\ 1 & x & 1 + \sigma x \\ - i\vartheta - \tfrac{1}{2}\psi_{10}(\beta_0) & -\sigma x & k - x + i\vartheta \end{vmatrix} = 0 \qquad 10.42$$

in which $$1 - \psi_{10}(\beta_0) = 1 - F_{10}(\beta_0) + \frac{2\bar{w}_0}{c_1} S_{10}(\beta_0) \qquad 10.43$$

$$\vartheta = \frac{1}{\beta^2}\ \frac{A_0}{A_1}\ \frac{4\bar{w}_0}{c} \qquad 10.44$$

this term representing the viscous drag due to the steady stream. It will be noted that ϑ is small over the range of values of α which are of interest. For example, in the femoral artery, $\alpha^2 \sim 7$, $\frac{A_0}{A_1} \sim \frac{1}{8}$, and $\bar{w}_0/c. \sim .03$ so that $\vartheta < 1/450$. Even in the thoracic aorta, assuming $\frac{A_0}{A_1} = 1$, $\bar{w}_0/c = 1/4$, $\vartheta < 0.01$, since $\alpha^2 \sim 100$.

Applying the same method of reduction of the determinant as was used in Section III, it reduces to the quadratic equation

$$(1-\sigma^2)\ x^2 - 2G''x + H'' = 0$$

in which

$$G'' = \frac{1 + \frac{k}{2} - \sigma - i\vartheta\left(\frac{1}{2} - \sigma\right)}{1 - \psi_{10}} + \frac{k}{2} + \sigma - \frac{1}{4} + \frac{i\vartheta}{2}$$

and

$$H'' = \frac{1 + 2k}{1 - \psi_{10}} - 1.$$

For $\sigma = 1/2$, the effect of the term $\frac{i\vartheta}{2}$ in G'' (leaving aside the substitution of $\psi_{10}(\beta_0)$ for $F_{10}(\alpha)$, which is discussed below) will be to reduce the imaginary part of G'', and therefore to reduce the damping of the wave in transmission, if the steady stream is in the same direction as the velocity of propagation. If it is in the opposite direction, damping will be increased. In the limiting condition of heavy loading and stiff constraint, $(k \rightarrow -\infty)$ the viscous drag of the steady stream will have no effect, as might be expected.

The effect of the substitution of $\psi_{10}(\beta)$ for $F_{10}(\alpha)$ can be studied very simply for this limiting condition. When $k \rightarrow -\infty$,

$$x = \frac{2}{1-\psi_{10}}$$

so that

$$(1 - \sigma^2)\ \frac{x}{2} = \frac{(1 - \sigma^2)\quad \left(1 - \frac{2\bar{w}_0}{c_1}\right)}{1 - F_{10}(\beta_0) + \frac{2\bar{w}_0}{c_1} S_{10}(\beta_0)} \qquad 10.45$$

and from this $\frac{c_1}{c_0}$ and $e^{-2\pi y/x}$ may be calculated. A plot of $\frac{c_1}{C_0}$ foi $\sigma = \frac{1}{2}$, $k = -\infty$, $\frac{2\bar{w}_0}{c_1} = 0.06$ (as in McDonald's experiment) is shown in Figure 35, with the corresponding plot for $\sigma = \frac{1}{2}$, $k = -\infty$ with no steady component for comparison. It will be seen that the presence of the steady stream raises the wave-velocity,by 6 - 8%. A plot of $e^{-\frac{2\pi y}{x}}$ is shown in Fig. 36. It will be seen that the damping of the wave in transmission is practically unchanged by the presence of the steady stream. It appears to be very slightly increased. This effect is opposite from that predicted by Morgan and Ferrante (1955) but

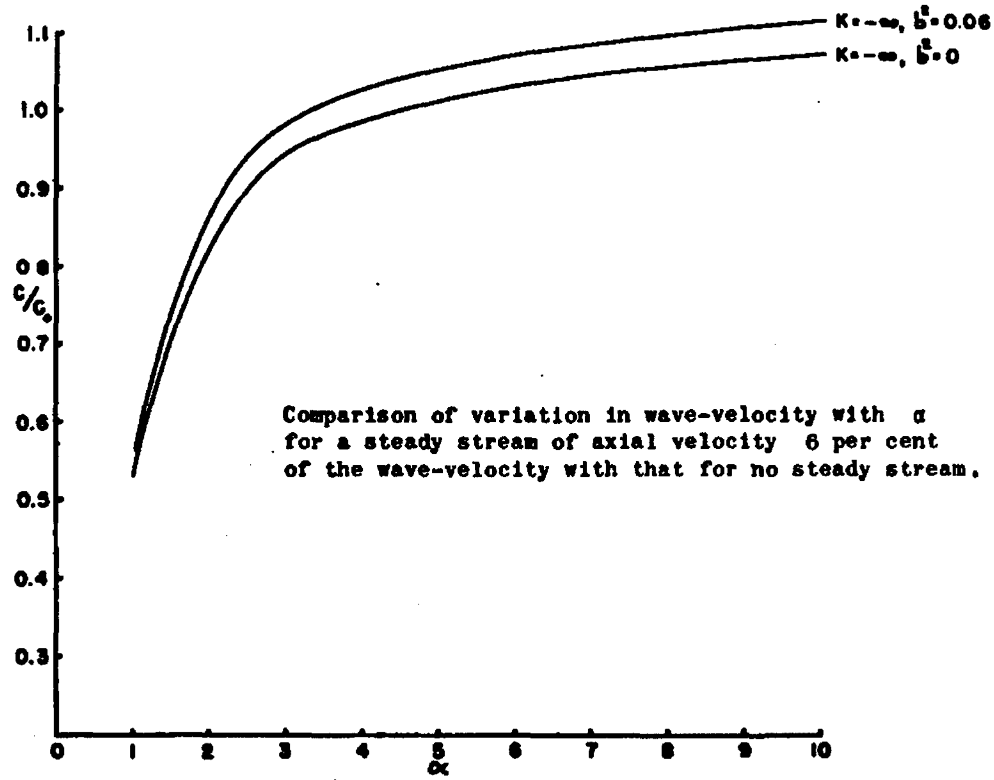

K = −∞, b^2 = 0.06
K = −∞, b^2 = 0
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
c/c_0
Comparison of variation in wave-velocity with α for a steady stream of axial velocity 6 per cent of the wave-velocity with that for no steady stream.
0
1
2
3
4
5
6
7
8
9
10
α

FIG 36

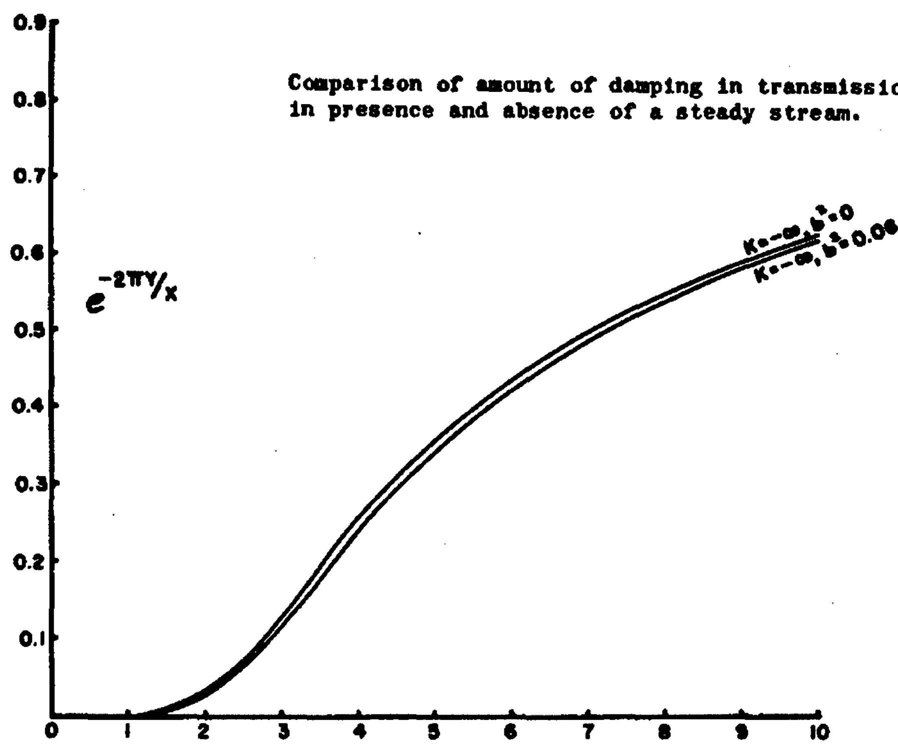

0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
$e^{-2\pi Y/X}$
Comparison of amount of damping in transmission in presence and absence of a steady stream.
K = −∞, b^2 = 0
K = −∞, b^2 = 0.06
0
1
2
3
4
5
6
7
8
9
10

FIG. 37

in view of the widely different conditions, is not in conflict with their conclusions.

For larger values of $2Wo/c$ this very simple approximation breaks down, and there would seem to be no alternative to a full scale tabulation of the required solutions of the Confluent Hypergeometric Equation, and an attack on the problem in full generality. Before this can be contemplated, measurements of the comparative magnitudes of the steady and oscillatory components of flow in the major arteries are needed, together with accurate measurements of pulse-velocity over short distances, to delimit the ranges of the parameters.

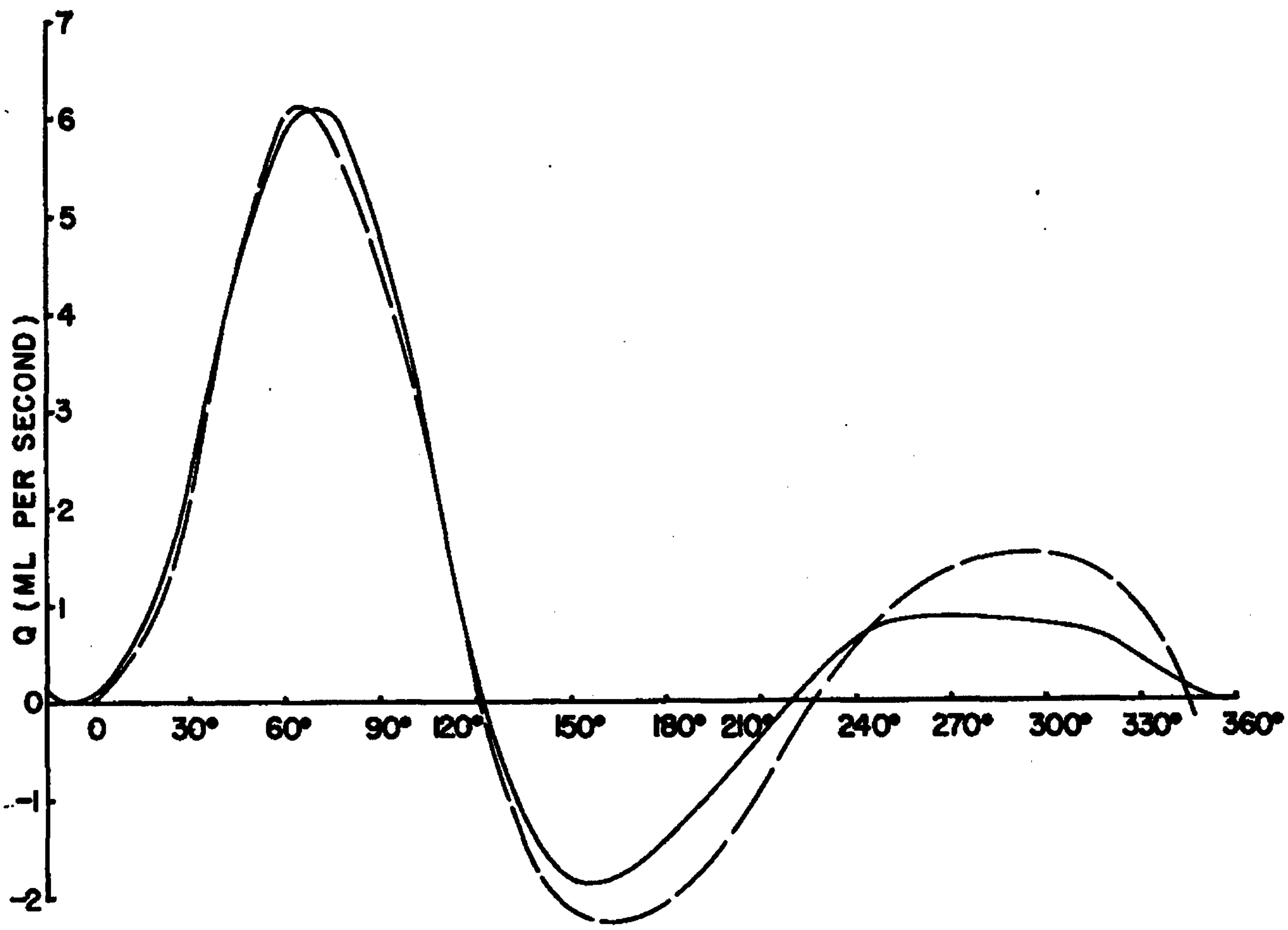


FIG. 35

TABLE 8.

β_0 / α	$S_{10}(\beta_0)$ For $K = -\infty$				$1-F_{10}(\alpha)$	
	REAL	IMAGINARY	MODULUS	PHASE DEGREES	REAL	IMAGINARY
0.00	0.0000	0.0000	0.0000	-45.0000	0.0000	0.0000
0.05	-0.0003	0.0002	0.0004	-34.5857	0.0000	0.0003
0.10	-0.0012	0.0001	0.0012	- 2.4966	0.0000	0.0012
0.15	-0.0028	0.0000	0.0028	- 0.7242	0.0000	0.0028
0.20	-0.0050	0.0001	0.0050	- 0.8379	0.0000	0.0050
0.25	-0.0077	0.0002	0.0077	- 1.2479	0.0001	0.0078
0.30	-0.0111	0.0003	0.0111	- 1.7534	0.0002	0.0112
0.35	-0.0150	0.0006	0.0150	- 2.3530	0.0003	0.0153
0.40	-0.0195	0.0010	0.0195	- 3.0666	0.0005	0.0200
0.45	-0.0245	0.0017	0.0245	- 3.8691	0.0009	0.0253
0.50	-0.0300	0.0025	0.0301	- 4.7758	0.0013	0.0312
0.55	-0.0359	0.0036	0.0361	- 5.7744	0.0019	0.0377
0.60	-0.0422	0.0051	0.0426	- 6.8697	0.0027	0.0448
0.65	-0.0489	0.0069	0.0494	- 8.0584	0.0037	0.0525
0.70	-0.0559	0.0092	0.0567	- 9.3405	0.0050	0.0608
0.75	-0.0631	0.0119	0.0642	-10.7150	0.0065	0.0697
0.80	-0.0705	0.0152	0.0721	-12.1805	0.0084	0.0791
0.85	-0.0779	0.0190	0.0802	-13.7358	0.0107	0.0890
0.90	-0.0853	0.0235	0.0885	-15.3797	0.0134	0.0994
0.95	-0.0926	0.0285	0.0968	-17.1101	0.0166	0.1102
1.00	-0.0996	0.0342	0.1053	-18.9252	0.0202	0.1215
1.05	-0.1064	0.0404	0.1138	-20.8222	0.0244	0.1332
1.10	-0.1127	0.0474	0.1222	-22.7987	0.0292	0.1452
1.15	-0.1184	0.0549	0.1305	-24.8512	0.0346	0.1574
1.20	-0.1236	0.0629	0.1386	-26.9766	0.0407	0.1699
1.25	-0.1280	0.0714	0.1465	-29.1708	0.0474	0.1826
1.30	-0.1315	0.0804	0.1542	-31.4297	0.0549	0.1953
1.35	-0.1342	0.0897	0.1614	-33.7487	0.0630	0.2081
1.40	-0.1359	0.0992	0.1683	-36.1231	0.0718	0.2208
1.45	-0.1366	0.1089	0.1747	-38.5476	0.0814	0.2334
1.50	-0.1363	0.1186	0.1806	-41.0167	0.0917	0.2458
1.55	-0.1349	0.1281	0.1861	-43.5247	0.1027	0.2580
1.60	-0.1325	0.1375	0.1909	-46.0659	0.1143	0.2698
1.65	-0.1290	0.1465	0.1953	-48.6341	0.1266	0.2811
1.70	-0.1246	0.1551	0.1990	-51.2232	0.1395	0.2921
1.75	-0.1193	0.1632	0.2022	-53.8272	0.1529	0.3025
1.80	-0.1132	0.1706	0.2047	-56.4398	0.1668	0.3123
1.85	-0.1063	0.1773	0.2067	-59.0551	0.1812	0.3215
1.90	-0.0988	0.1833	0.2082	-61.6673	0.1959	0.3300
1.95	-0.0908	0.1884	0.2091	-64.2706	0.2109	0.3378
2.00	-0.0823	0.1927	0.2095	-66.8596	0.2262	0.3449

TABLE 8. CONTINUED

β_0 / α	$S_{10}(\beta_0)$ For $K = -\infty$				$1-F_{10}(\alpha)$	
	REAL	IMAGINARY	MODULUS	PHASE DEGREES	REAL	IMAGINARY
2.00	-0.0823	0.1927	0.2095	-66.8596	0.2262	0.3449
2.05	-0.0736	0.1961	0.2095	-69.4293	0.2417	0.3513
2.10	-0.0647	0.1987	0.2090	-71.9748	0.2572	0.3569
2.15	-0.0556	0.2005	0.2081	-74.4917	0.2728	0.3618
2.20	-0.0466	0.2015	0.2068	-76.9760	0.2884	0.3660
2.25	-0.0377	0.2017	0.2052	-79.4241	0.3039	0.3695
2.30	-0.0289	0.2013	0.2033	-81.8328	0.3192	0.3723
2.35	-0.0203	0.2002	0.2012	-84.1992	0.3344	0.3745
2.40	-0.0121	0.1985	0.1989	-86.5211	0.3494	0.3761
2.45	-0.0041	0.1963	0.1963	-88.7964	0.3640	0.3770
2.50	0.0035	0.1936	0.1937	88.9765	0.3784	0.3774
2.55	0.0107	0.1906	0.1909	86.7988	0.3924	0.3773
2.60	0.0175	0.1872	0.1881	84.6713	0.4061	0.3768
2.65	0.0239	0.1836	0.1851	82.5946	0.4193	0.3758
2.70	0.0299	0.1797	0.1822	80.5690	0.4322	0.3744
2.75	0.0354	0.1757	0.1792	78.5944	0.4447	0.3726
2.80	0.0406	0.1715	0.1763	76.6706	0.4568	0.3706
2.85	0.0455	0.1673	0.1734	74.7971	0.4684	0.3683
2.90	0.0499	0.1630	0.1705	72.9732	0.4797	0.3657
2.95	0.0540	0.1587	0.1676	71.1982	0.4905	0.3629
3.00	0.0578	0.1544	0.1649	69.4710	0.5010	0.3600
3.05	0.0613	0.1501	0.1621	67.7906	0.5110	0.3569
3.10	0.0645	0.1459	0.1595	66.1557	0.5207	0.3536
3.15	0.0674	0.1417	0.1569	64.5651	0.5300	0.3503
3.20	0.0701	0.1376	0.1544	63.0175	0.5389	0.3468
3.25	0.0725	0.1336	0.1520	61.5116	0.5475	0.3434
3.30	0.0747	0.1297	0.1497	60.0458	0.5557	0.3398
3.35	0.0768	0.1259	0.1474	58.6189	0.5636	0.3363
3.40	0.0786	0.1221	0.1453	57.2293	0.5712	0.3327
3.45	0.0803	0.1185	0.1432	55.8758	0.5785	0.3292
3.50	0.0819	0.1150	0.1412	54.5567	0.5856	0.3256
3.55	0.0833	0.1116	0.1393	53.2709	0.5923	0.3221
3.60	0.0846	0.1083	0.1374	52.0169	0.5988	0.3185
3.65	0.0858	0.1051	0.1357	50.7934	0.6051	0.3151
3.70	0.0868	0.1020	0.1340	49.5991	0.6111	0.3116
3.75	0.0878	0.0990	0.1323	48.4328	0.6169	0.3082
3.80	0.0887	0.0961	0.1308	47.2933	0.6225	0.3049
3.85	0.0895	0.0933	0.1293	46.1794	0.6279	0.3016
3.90	0.0903	0.0906	0.1279	45.0900	0.6331	0.2984
3.95	0.0910	0.0879	0.1265	44.0241	0.6381	0.2952
4.00	0.0916	0.0853	0.1252	42.9807	0.6430	0.2921

TABLE 8. CONTINUED

β_0 / α	$S_{10}(\beta_0)$ For K = $-\infty$				$1-F_{10}(\alpha)$	
	REAL	IMAGINARY	MODULUS	PHASE DEGREES	REAL	IMAGINARY
4.00	0.0916	0.0853	0.1252	42.9807	0.6430	0.2921
4.05	0.0921	0.0829	0.1239	41.9587	0.6477	0.2890
4.10	0.0927	0.0804	0.1227	40.9573	0.6522	0.2860
4.15	0.0931	0.0781	0.1215	39.9757	0.6566	0.2831
4.20	0.0936	0.0758	0.1204	39.0129	0.6609	0.2802
4.25	0.0940	0.0736	0.1194	38.0683	0.6651	0.2774
4.30	0.0943	0.0714	0.1183	37.1412	0.6691	0.2747
4.35	0.0946	0.0693	0.1173	36.2308	0.6730	0.2720
4.40	0.0949	0.0673	0.1164	35.3365	0.6769	0.2693
4.45	0.0952	0.0653	0.1154	34.4578	0.6806	0.2667
4.50	0.0954	0.0634	0.1145	33.5941	0.6842	0.2642
4.55	0.0956	0.0615	0.1137	32.7449	0.6877	0.2617
4.60	0.0958	0.0596	0.1128	31.9097	0.6911	0.2593
4.65	0.0959	0.0578	0.1120	31.0880	0.6945	0.2569
4.70	0.0960	0.0561	0.1112	30.2796	0.6978	0.2546
4.75	0.0961	0.0544	0.1104	29.4840	0.7010	0.2523
4.80	0.0962	0.0527	0.1097	28.7008	0.7041	0.2501
4.85	0.0963	0.0510	0.1090	27.9298	0.7072	0.2479
4.90	0.0963	0.0494	0.1082	27.1706	0.7101	0.2458
4.95	0.0963	0.0479	0.1076	26.4230	0.7131	0.2437
5.00	0.0963	0.0463	0.1069	25.6867	0.7159	0.2416
5.05	0.0963	0.0448	0.1062	24.9614	0.7188	0.2396
5.10	0.0963	0.0434	0.1056	24.2471	0.7215	0.2376
5.15	0.0962	0.0419	0.1049	23.5434	0.7242	0.2356
5.20	0.0961	0.0405	0.1043	22.8502	0.7269	0.2337
5.25	0.0960	0.0391	0.1037	22.1673	0.7294	0.2318
5.30	0.0959	0.0378	0.1031	21.4946	0.7320	0.2300
5.35	0.0958	0.0365	0.1025	20.8318	0.7345	0.2282
5.40	0.0957	0.0352	0.1019	20.1789	0.7369	0.2264
5.45	0.0955	0.0339	0.1014	19.5358	0.7394	0.2246
5.50	0.0954	0.0327	0.1008	18.9022	0.7417	0.2229
5.55	0.0952	0.0314	0.1002	18.2780	0.7441	0.2212
5.60	0.0950	0.0302	0.0997	17.6632	0.7463	0.2195
5.65	0.0948	0.0291	0.0991	17.0576	0.7486	0.2179
5.70	0.0946	0.0279	0.0986	16.4612	0.7508	0.2163
5.75	0.0943	0.0268	0.0981	15.8737	0.7530	0.2147
5.80	0.0941	0.0257	0.0976	15.2951	0.7551	0.2131
5.85	0.0939	0.0247	0.0971	14.7253	0.7572	0.2115
5.90	0.0936	0.0236	0.0966	14.1642	0.7593	0.2100
5.95	0.0934	0.0226	0.0960	13.6116	0.7613	0.2085
6.00	0.0931	0.0216	0.0956	13.0675	0.7633	0.2070

TABLE 8. CONTINUED

β_0 / α	$S_{10}(\beta_0)$ For $K = -\infty$				$1-F_{10}(\alpha)$	
	REAL	IMAGINARY	MODULUS	PHASE DEGREES	REAL	IMAGINARY
6.00	0.0931	0.0216	0.0956	13.0675	0.7633	0.2070
6.05	0.0928	0.0206	0.0951	12.5318	0.7652	0.2056
6.10	0.0925	0.0197	0.0946	12.0043	0.7672	0.2041
6.15	0.0922	0.0187	0.0941	11.4849	0.7691	0.2027
6.20	0.0919	0.0178	0.0936	10.9735	0.7710	0.2013
6.25	0.0916	0.0169	0.0932	10.4701	0.7728	0.1999
6.30	0.0913	0.0161	0.0927	9.9745	0.7746	0.1985
6.35	0.0910	0.0152	0.0922	9.4866	0.7764	0.1972
6.40	0.0907	0.0144	0.0918	9.0062	0.7782	0.1959
6.45	0.0903	0.0136	0.0913	8.5333	0.7799	0.1945
6.50	0.0900	0.0128	0.0909	8.0678	0.7816	0.1932
6.55	0.0897	0.0120	0.0904	7.6095	0.7833	0.1920
6.60	0.0893	0.0112	0.0900	7.1583	0.7849	0.1907
6.65	0.0890	0.0105	0.0896	6.7141	0.7866	0.1894
6.70	0.0886	0.0097	0.0892	6.2769	0.7882	0.1882
6.75	0.0883	0.0090	0.0887	5.8463	0.7897	0.1870
6.80	0.0879	0.0083	0.0883	5.4225	0.7913	0.1858
6.85	0.0876	0.0077	0.0879	5.0051	0.7928	0.1846
6.90	0.0872	0.0070	0.0875	4.5942	0.7943	0.1834
6.95	0.0869	0.0064	0.0871	4.1896	0.7958	0.1823
7.00	0.0865	0.0057	0.0867	3.7912	0.7973	0.1811
7.05	0.0861	0.0051	0.0863	3.3989	0.7988	0.1800
7.10	0.0858	0.0045	0.0859	3.0125	0.8002	0.1789
7.15	0.0854	0.0039	0.0855	2.6319	0.8016	0.1778
7.20	0.0851	0.0034	0.0851	2.2571	0.8030	0.1767
7.25	0.0847	0.0028	0.0847	1.8879	0.8044	0.1756
7.30	0.0843	0.0022	0.0844	1.5241	0.8057	0.1745
7.35	0.0840	0.0017	0.0840	1.1658	0.8070	0.1735
7.40	0.0836	0.0012	0.0836	0.8128	0.8083	0.1724
7.45	0.0832	0.0007	0.0833	0.4649	0.8096	0.1714
7.50	0.0829	0.0002	0.0829	0.1222	0.8109	0.1704
7.55	0.0825	-0.0003	0.0825	- 0.2156	0.8122	0.1694
7.60	0.0822	-0.0008	0.0822	- 0.5486	0.8134	0.1684
7.65	0.0818	-0.0013	0.0818	- 0.8767	0.8147	0.1674
7.70	0.0815	-0.0017	0.0815	- 1.2002	0.8159	0.1664
7.75	0.0811	-0.0022	0.0811	- 1.5191	0.8171	0.1655
7.80	0.0807	-0.0026	0.0808	- 1.8336	0.8182	0.1645
7.85	0.0804	-0.0030	0.0805	- 2.1436	0.8194	0.1636
7.90	0.0800	-0.0034	0.0801	- 2.4494	0.8206	0.1627
7.95	0.0797	-0.0038	0.0798	- 2.7509	0.8217	0.1617
8.00	0.0793	-0.0042	0.0795	- 3.0483	0.8228	0.1608

TABLE 8. CONTINUED

β_0 / α	$S_{10}(\beta_0)$ For $K = -\infty$ REAL	IMAGINARY	MODULUS	PHASE DEGREES	$1-F_{10}(\alpha)$ REAL	IMAGINARY
8.00	0.0793	-0.0042	0.0795	- 3.0483	0.8228	0.1608
8.05	0.0790	-0.0046	0.0791	- 3.3417	0.8239	0.1599
8.10	0.0787	-0.0050	0.0788	- 3.6311	0.8250	0.1590
8.15	0.0783	-0.0054	0.0785	- 3.9166	0.8261	0.1582
8.20	0.0780	-0.0057	0.0782	- 4.1984	0.8272	0.1573
8.25	0.0776	-0.0061	0.0779	- 4.4764	0.8282	0.1564
8.30	0.0773	-0.0064	0.0776	- 4.7507	0.8292	0.1556
8.35	0.0770	-0.0068	0.0772	- 5.0215	0.8303	0.1547
8.40	0.0766	-0.0071	0.0769	- 5.2888	0.8313	0.1539
8.45	0.0763	-0.0074	0.0766	- 5.5526	0.8323	0.1531
8.50	0.0760	-0.0077	0.0763	- 5.8131	0.8333	0.1523
8.55	0.0756	-0.0080	0.0760	- 6.0703	0.8343	0.1515
8.60	0.0753	-0.0083	0.0758	- 6.3242	0.8352	0.1507
8.65	0.0750	-0.0086	0.0755	- 6.5749	0.8362	0.1499
8.70	0.0746	-0.0089	0.0752	- 6.8226	0.8371	0.1491
8.75	0.0743	-0.0092	0.0749	- 7.0671	0.8381	0.1483
8.80	0.0740	-0.0095	0.0746	- 7.3087	0.8390	0.1475
8.85	0.0737	-0.0098	0.0743	- 7.5473	0.8399	0.1468
8.90	0.0734	-0.0100	0.0740	- 7.7830	0.8408	0.1460
8.95	0.0730	-0.0103	0.0738	- 8.0159	0.8417	0.1453
9.00	0.0727	-0.0105	0.0735	- 8.2460	0.8426	0.1446
9.05	0.0724	-0.0108	0.0732	- 8.4733	0.8435	0.1438
9.10	0.0721	-0.0110	0.0730	- 8.6980	0.8443	0.1431
9.15	0.0718	-0.0113	0.0727	- 8.9200	0.8452	0.1424
9.20	0.0715	-0.0115	0.0724	- 9.1394	0.8460	0.1417
9.25	0.0712	-0.0117	0.0722	- 9.3562	0.8469	0.1410
9.30	0.0709	-0.0120	0.0719	- 9.5706	0.8477	0.1403
9.35	0.0706	-0.0122	0.0716	- 9.7825	0.8485	0.1396
9.40	0.0703	-0.0124	0.0714	- 9.9919	0.8493	0.1389
9.45	0.0700	-0.0126	0.0711	-10.1990	0.8501	0.1382
9.50	0.0697	-0.0128	0.0709	-10.4037	0.8509	0.1376
9.55	0.0694	-0.0130	0.0706	-10.6061	0.8517	0.1369
9.60	0.0691	-0.0132	0.0704	-10.8063	0.8525	0.1363
9.65	0.0688	-0.0134	0.0701	-11.0042	0.8532	0.1356
9.70	0.0686	-0.0136	0.0699	-11.1999	0.8540	0.1350
9.75	0.0683	-0.0138	0.0696	-11.3935	0.8547	0.1343
9.80	0.0680	-0.0139	0.0694	-11.5849	0.8555	0.1337
9.85	0.0677	-0.0141	0.0692	-11.7742	0.8562	0.1331
9.90	0.0674	-0.0143	0.0689	-11.9615	0.8569	0.1325
9.95	0.0671	-0.0145	0.0687	-12.1468	0.8577	0.1319
10.00	0.0669	-0.0146	0.0684	-12.3301	0.8584	0.1312

SECTION XI

SUMMARY AND CONCLUSIONS.

This exploration of the consequences of taking an elastic tube as a rough working model of an artery leads to two broad general conclusions. The rate of flow generated by a known oscillatory pressure gradient does not vary greatly over a wide range of conditions of added mass and longitudinal constraint, and the phase-difference between cyclic variations in pressure and diameter is also insensitive to wide variations in these conditions. For accurate deductions to be made about the conditions of support, measurements are needed of a higher degree of accuracy than any at present available. Until such measurements can be made, nothing is lost by assuming conditions of heavy loading and stiff constraint. For this model all the relationships between observable quantities take their simplest form. The relationship between pressure gradient and flow is the same as for a rigid tube (disregarding the non-linear corrections) and the cyclic variations in pressure and diameter are always in phase with each other, being connected by the simple constant $\frac{1}{\rho_o c_o^2}$. The experimental results of McDonald (1955) on the relationship between pressure gradient and flow, and the measurements made by Lawton (1956) of pressure and diameter variations, are in accord with this simple theory, though the claim that they confirm it, in the full sense of the word, is less than justified. It is better, rather, to say that until experimental evidence is forthcoming which compels the use of a more elaborate theory, this is fully adequate in relation to the evidence available. These two relationships (between pressure gradient and flow, and between pressure and diameter) have the advantage that their form is independent of the amplitude of any reflected wave that may be present. The multiplying constant in the relationship between pressure and flow is changed considerably by the presence of a reflected wave, and is therefore not suitable for a direct test of the theory.

Another important advantage of the method used by McDonald is the fact that the average velocity was measured. It was shown in Section VIII that the effect of the correction for finite expansion on the average velocity is small, and therefore a comparison with the linear theory is adequate. If, however a true measurement of mass-flow had been made, the measurements would have included the factor $1 + \frac{2\xi}{R}$, and the comparison of the observations with the theory made more difficult.

When measurements of the true volume flow are made in the undisturbed artery, the calculation of the average velocity is possible, if a recording of pressure is taken at the same time. The quantity $\frac{2\xi}{R}$ can be calculated from

$$\frac{2\xi}{R} = \frac{3}{4}\,\frac{p}{\rho_0 c_0^2}$$

and the rate of flow divided by $(1 + \frac{2\xi}{R}).\pi R^2$ to give an estimate of the average velocity.

It would seem from present knowledge that further refinement of the theory by elaboration of properties of the arterial wall, however desirable, is not mandatory at the present time. The next step would seem to be the improvement of the perturbation theory by using as the first approximation in it the "exact" solution in the presence of the steady stream, and the preparation of full tables for the calculation of those perturbation corrections that prove to be important. When this has been done, it will be necessary to examine how far these non-linearities affect the reflection calculations. The author also proposes to have computed some solutions of the Confluent Hypergeometric Equation as a check on the accuracy of the approximate solution. Two other modifications of the theory also need to be studied, the question of the anomalous viscosity of blood, and the effect of small branches on the flow, by making the artery, in effect, a porous tube.

The question may be asked, how far is the theory applicable to the flow of blood in veins? The answer probably is, so far as the motion of the blood in the large veins is oscillatory. The motion of the blood in the veins is not derived directly from a periodic injection of blood propagating a pressure wave. The veins are a drainage system, and some of the larger peripheral veins have non-return valves built into them. This results in these veins themselves acting as pumps, driven by muscular movements which do not have the clockwork regularity of the heart action. Nearer the heart the oscillatory motion of the blood is compounded of two basic effects, changes in intra-thoracic pressure during the respiratory cycle, and the movements of the heart. Furthermore, the veins are very expansible, and the first-order correction given here may not be adequate. This suggests that the problem of flow in veins may be worthy of a separate theoretical study, but the present theory might well be tested out to see how far it is applicable.

Finally, it may be added that parts of this theory might well apply to hydraulic servomechanisms and other devices in which pipes filled with liquid are used as transmission links. As has been said in Section II, some work has been done in this direction, but the application to servomechanisms has scarcely begun.

REFERENCES

Branson (1945)	Bull. Math. Biophysics	Vol.7,	181
Egami (1944)	J. Physiol. Soc. Japan (in Japanese)	Vol.9, and	742-748 749-754
Hale, J.F., McDonald, D.A., and Womersley, J.R. (1955).	J. Physiol.	Vol.128	629-640
Inouye, A., and Hidekuni, K., (1954)	J. Physiol. Soc. Japan	Vol.4,	205-220
Kaneman, G., (1952)	Bull. Math. Biophysics	Vol.14,	327-350
(1953)	" " "	Vol.15	185-195
(1954)	" " "	Vol.16	111-116
Lamb, H. (1898)	Mem.Manchester Lit. and Phil Soc.	Vol.42	No. 9
Lambossy, P. (1951)	Helvetica Physiologica Acta.	Vol.9	145-
Lambossy, P. (1953)	Helvetica Physica Acta.	Vol.25	371-386
McDonald, D. A. (1955)	J. Physiol.	Vol.127	533-552
Morgan, G. W., and Kiely, J.P.	J. Acoustic Soc. Am.	Vol.26	323-
Morgan, G.W., and Ferrante, W.R.	J. Acoustic Soc. Am.	Vol.27	715-725
Müller, A. (1951)	Helvetica Physiologica Acta.	Vol.9	162-
Müller, A. (1954)	Helvetica Physiologica Acta	Vol.12	98-111
Richardson, E. G., and Jyler, W. (1929)	Proc. Phys. Soc.	Vol.42,	1-15
Sexl, H. (1930)	Zeitschr, für Physik		
Thurston, R., (1952)	J. Acoustic Soc. Am.	Vol.25	26-
Witzig, S. (1914)	Inaugural Dissertation, Berne		
Womersley, J. R. (1955a)	Philos. Mag.	Vol.46	199-221
Womersley, J. R. (1955b)	J. Physiol.	Vol.127,	553-563

Lawton, R. W., and Greene, L.C. (1956 U. S. Naval Air Development Center, Report # NADC-MA-5603

APPENDIX

TABLES FOR PULSE-VELOCITY AND FLOW CALCULATIONS

1. Statement of the Problem:

The following functions, were submitted for computation by Mr. John R. Womersley of WCRRU.

(1) The complex function $\frac{(1-\sigma^2)x}{2}$, where x is one root of the equation $(1-\sigma^2)x^2 - 2Gx + H = 0.$

$$G = \frac{1.25-\sigma}{1-F_{10}} + \frac{k}{2} + \sigma - .25$$

$$H = \frac{1+2k}{1-F_{10}} - 1$$

and

$$(1-\sigma^2)x = G + \sqrt{G^2-(1-\sigma^2)H}$$

$$1-F_{10} = 1 - \frac{2}{\alpha i^{3/2}} \cdot \frac{J_1(\alpha i^{3/2})}{J_0(\alpha i^{3/2})}$$

$$\alpha = 1(0.05)10$$

$$k = 0.0,\ 0.1,\ 0.2,\ 0.4$$

$$\sigma = 0.00,\ 0.25,\ 0.50$$

and

$$k = -1.0,\ -2.0,\ -5.0,\ -10.0$$

when $\sigma = 0.50$.

(2) The functions $\frac{1}{X}$, $2\pi\frac{Y}{X}$, and $e^{-2\pi\frac{Y}{X}}$, where

$$\frac{(1-\sigma^2)x}{2} = (X-iY)^2.$$

(3) The complex functions $-\eta$, $1+\eta$, and $1+\eta F_{10}$, where

$$\eta = \frac{2}{x} \cdot \frac{1}{(F_{10}-2\sigma)} - \frac{1-2\sigma}{F_{10}-2\sigma}.$$

In addition, the behavior of the function $\frac{1+\eta F_{10}}{\alpha^2}$ as $\alpha \rightarrow 0$ is analyzed at the end of this introduction.

2. Method of Computation

The values of $J_0(\alpha i^{3/2}) = \text{Ber}\ \alpha + i\ \text{Bei}\ \alpha$ were computed from

$$\text{Ber}\ \alpha \approx \sum_{n=0}^{n=18} (-1)^n \frac{(\alpha/2)^{4n}}{(2n)!^2}$$

$$\text{Bei}\ \alpha \approx \sum_{n=0}^{n=19} (-1)^{n-1} \frac{(\alpha/2)^{4n-2}}{(2n-1)!^2}.$$

The first derivative, $\frac{dJ_0(\alpha i^{3/2})}{d\alpha} = \text{Ber}'\,\alpha + i\,\text{Bei}'\,\alpha$ and the second derivative $\frac{d^2J_0(\alpha i^{3/2})}{d\alpha^2} = \text{Ber}''\,\alpha + i\,\text{Bei}''\,\alpha$ were computed from

$$\text{Ber}'\,\alpha \approx \sum_{n=0}^{n=18} (-1)^n \frac{2n(\alpha/2)^{4n-1}}{(2n)!^2}$$

$$\text{Bei}'\,\alpha \approx \sum_{n=0}^{n=19} (-1)^{n-1} \frac{(2n-1)(\alpha/2)^{4n-3}}{(2n-1)!^2}$$

$$\text{Ber}''\,\alpha \approx \sum_{n=0}^{n=18} (-1)^n \frac{n(4n-1)(\alpha/2)^{4n-2}}{(2n)!^2}$$

$$\text{Bei}''\,\alpha \approx \sum_{n=0}^{n=19} (-1)^{n-1} \frac{(2n-1)(4n-3)(\alpha/2)^{4n-4}}{2(2n-1)!^2}.$$

The number of terms used was sufficient to give ten significant figures of accuracy for values of "α" up to 20 although "α" has a maximum value of 10 in the functions reported here. This was done in order that the same program might be used at a later date as a sub-routine in computing the non-linear corrections which require values of $J_0(xi^{3/2})$ up to $x = 20$.

It may be of general interest to note that these series were computed on the Mark IV Calculator at a fixed decimal point although it appeared at first that floating decimal routines would be necessary since the series contain numbers such as $\frac{1}{(36!)^2}$, $\frac{1}{(34!)^2}$, etc.

The method used can be applied quite generally to any series which contains many terms and high order factorials, and the fact that it utilizes fixed decimal point operation means a saving of many hours of machine time and coding time.

To illustrate, take the series

$$\text{Ber } x \approx 1 - \frac{(x/2)^4}{(2!)^2} + \frac{(x/2)^8}{(4!)^2} - \frac{(x/2)^{12}}{(6!)^2} + \dots - \frac{(x/2)^{68}}{(34!)^2} + \frac{(x/2)^{72}}{(36!)^2}.$$

The usual method of setting this up for computation would be

$$\text{Ber } x \approx \left[\left[\left[\left[\frac{(x/2)^4}{(36!)^2} - \frac{1}{(34!)^2}\right]\left(\frac{x}{2}\right)^4 + \frac{1}{(32!)^2}\right]\left(\frac{x}{2}\right)^4 - \frac{1}{(30!)^2}\right]\left(\frac{x}{2}\right)^4 + \dots\right]\left(\frac{x}{2}\right)^4 + 1.$$

Clearly, floating decimals are necessary for this evaluation on account of the terms $\frac{1}{(36!)^2}$, $\frac{1}{(34!)^2}$, etc.

To get around this difficulty, factor the term $\frac{1}{(34!)^2}$ from the first expression in brackets and then factor the term $\frac{1}{(32!)^2}$ from the second expression in brackets, and so on until all the constants have been reduced to ± 1. The resulting expression will be

$$\text{Ber } x \approx \left[\left[\left[\left[\frac{(x/2)^4}{(36 \cdot 35)^2} - 1\right]\frac{(x/2)^4}{(34 \cdot 33)^2} + 1\right]\frac{(x/2)^4}{(32 \cdot 31)^2} - 1\right]\frac{(x/2)^4}{(30 \cdot 29)^2} + \dots\right]\frac{(x/2)^4}{(2 \cdot 1)^2} + 1.$$

Here is an expression which will oscillate between -1 and +1 as the summation proceeds for values of $(\frac{x}{2})^4$ from 0 to 10^6. This is, therefore, a powerful method of evaluating a series at a fixed decimal point.

The accuracy of the method, however, is limited by the operating decimal point. This problem was operated at decimal point 11/10 and it was found for example that Ber 20, which is of the order of 47,489.370, was accurate to eight significant figures or only three decimal places. In general it can be said that the number of accurate significant figures in the results can never be more than the number of decimals carried minus the round off error. The reason for this, of course, is the very fact that the successive values of the summation oscillate very close to unity up to the last two or three closing terms.

The entire evaluation was checked by the following identities:

$$\text{Ber}'' \alpha + \frac{1}{\alpha} \text{Ber}' \alpha + \text{Bei} \alpha = 0$$

$$\text{Bei}'' \alpha + \frac{1}{\alpha} \text{Bei}' \alpha - \text{Ber} \alpha = 0.$$

The values of $J_1(\alpha i^{3/2}) = \text{Ber}_1 \alpha + i \, \text{Bei}_1 \alpha$ were then obtained from the recurrence relations

$$\text{Ber}_1 \alpha = \frac{1}{\sqrt{2}} (\text{Ber}' \alpha - \text{Bei}' \alpha)$$

$$\text{Bei}_1 \alpha = \frac{1}{\sqrt{2}} (\text{Ber}' \alpha + \text{Bei}' \alpha).$$

The remaining computations consisted essentially of straight forward substitution of the parameters in the functions under investigation.

The tables are believed to be accurate to $\pm .6$ in the last decimal, all values having been rounded off.

The final results were checked by taking 5th differences. Running time on the Mark IV Calculator was approximately forty hours.

3. Evaluation of $\lim\limits_{\alpha \to 0} \dfrac{1+\eta F_{10}}{\alpha^2}$

$$F_{10} = \frac{2}{\alpha i^{3/2}} \cdot \frac{J_1(\alpha i^{3/2})}{J_0(\alpha i^{3/2})}.$$

Let $\alpha i^{3/2} = z$, then

$$J_1(z) = \frac{z}{2} - \frac{z^3}{16} + \frac{z^5}{384} - \frac{z^7}{18432} + \cdots$$

$$J_0(z) = 1 - \frac{z^2}{4} + \frac{z^4}{64} - \frac{z^6}{2304} + \cdots$$

$$F_{10} = \frac{2}{z} \cdot \frac{J_1(z)}{J_0(z)} = \frac{1 - \frac{z^2}{8} + \frac{z^4}{192} - \frac{z^6}{9216} + \cdots}{1 - \frac{z^2}{8} + \frac{z^4}{64} - \frac{z^6}{2304} + \cdots}$$

$$= 1 + \frac{z^2}{8} + \frac{z^4}{48} + \frac{11}{3072} \cdot z^6 + \cdots.$$

Substituting $z = \alpha i^{3/2}$

$$F_{10} = 1 - i\frac{\alpha^2}{8} - \frac{\alpha^4}{48} + i\frac{11}{3072}\alpha^6 + \cdots$$

$$1 - F_{10} = i\frac{\alpha^2}{8} + \frac{\alpha^4}{48} - i\frac{11}{3072}\alpha^6 + \cdots$$

and by division

$$\frac{1}{1-F_{10}} = \frac{8}{\alpha^2 i} + \frac{4}{3} - i\frac{\alpha^2}{144} + \cdots$$

$\therefore$ as $\alpha \longrightarrow 0$

$$F_{10} \longrightarrow 1 - i\frac{\alpha^2}{8}$$

$$1 - F_{10} \longrightarrow \frac{\alpha^4}{48} + i\frac{\alpha^2}{8}$$

$$\frac{1}{1-F_{10}} \longrightarrow \frac{4}{3} - i\frac{8}{\alpha^2}.$$

For the case where $\sigma = 0$ and $k = 0$, we have, as $\alpha \longrightarrow 0$

$$G = \frac{5}{4}\left(\frac{4}{3} - i\frac{8}{\alpha^2}\right) - \frac{1}{4}$$

$$= \frac{17}{12} - i\frac{10}{\alpha^2}$$

$$G^2 = \left(\frac{17}{12}\right)^2 - \frac{100}{\alpha^4} - i\frac{85}{3\alpha^2}$$

$$= -\frac{100}{\alpha^4} - i\frac{85}{3\alpha^2} \qquad \text{neglecting } \left(\frac{17}{12}\right)^2$$

$$H = \frac{1}{3} - i\frac{8}{\alpha^2}$$

$$G^2-(1-\sigma^2)H = -\frac{100}{\alpha^4} - i\frac{61}{3\alpha^2} \qquad \text{neglecting } -\frac{1}{3}$$

$$\sqrt{G^2-(1-\sigma^2)H} = \frac{61}{60} - i\frac{10}{\alpha^2} \qquad \text{neglecting } \left(\frac{61}{60}\right)^2$$

$$G + \sqrt{G^2-(1-\sigma^2)H} = \frac{146}{60} - i\frac{20}{\alpha^2}$$

$$\frac{(1-\sigma^2)x}{2} = \frac{73}{60} - i\frac{10}{\alpha^2}$$

$$\frac{2}{x} = \frac{\left(\frac{73}{60}+i\frac{10}{\alpha^2}\right)}{\left(\frac{73}{60}-i\frac{10}{\alpha^2}\right)\left(\frac{73}{60}+i\frac{10}{\alpha^2}\right)}$$

$$= \frac{\frac{73}{60} + i\frac{10}{\alpha^2}}{\frac{100}{\alpha^4}} \qquad \text{neglecting } \left(\frac{73}{60}\right)^2$$

$$= \frac{73}{6000}\alpha^4 + i\frac{\alpha^2}{10}$$

$$\eta = \left(\frac{2}{x}-1+2\sigma\right)\frac{1}{F_{10}-2\sigma} = \left(-1+i\frac{\alpha^2}{10}\right)\left(\frac{1}{1-i\frac{\alpha^2}{8}}\right) \qquad \text{neglecting } \frac{73}{6000}\alpha^4$$

$$\eta_{\alpha \to 0} = -1 - i\frac{\alpha^2}{40}$$

$$\eta F_{10\,\alpha \to 0} = \left(-1-i\frac{\alpha^2}{40}\right)\left(1-i\frac{\alpha^2}{8}\right)$$

$$= -1 + i\frac{\alpha^2}{10} \qquad \text{neglecting } -\frac{\alpha^4}{320}$$

and

$$\lim_{\alpha \to 0} \frac{1+\eta F_{10}}{\alpha^2} = \frac{1-1+i\frac{\alpha^2}{10}}{\alpha^2} = \frac{1}{10}i.$$

For all other values of k (i.e., 0.1, 0.2, 0.3, 0.4, -1.0, -2.0, -5.0, -10.0) this limit remains the same. The only values which change are the neglected terms and therefore do not affect the limit.

By a similar procedure for $\sigma = 0.25$

$$\lim_{\alpha \to 0} \frac{1+\eta F_{10}}{\alpha^2} = \frac{7}{64}i$$

and for $\sigma = 0.50$

$$\lim_{\alpha \to 0} \frac{1+\eta F_{10}}{\alpha^2} = \frac{1}{8}i.$$

κ = non-dimensional parameter $\kappa = R\sqrt{n/\nu}$ (p. IX)
η = complex constant appearing in flow formula
F_{10} = condensed notation, see p IX
$i = \sqrt{-1}$???

$k = 0.0 \qquad \sigma = 0.00$

a	$\frac{1-\sigma^2}{2}\cdot x$ REAL	$\frac{1-\sigma^2}{2}\cdot x$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
1.00	1.2180	-9.9928	0.4210	5.5638	0.0038	1.0054	0.0241	1.0057	1.37
1.05	1.2183	-9.0624	0.4393	5.4950	0.0041	1.0065	0.0263	1.0069	1.50
1.10	1.2186	-8.2559	0.4573	5.4238	0.0044	1.0078	0.0286	1.0082	1.63
1.15	1.2190	-7.5521	0.4749	5.3503	0.0047	1.0093	0.0309	1.0097	1.75
1.20	1.2194	-6.9343	0.4921	5.2747	0.0051	1.0109	0.0333	1.0114	1.88
1.25	1.2199	-6.3891	0.5088	5.1970	0.0055	1.0127	0.0356	1.0133	2.01
1.30	1.2204	-5.9055	0.5252	5.1175	0.0060	1.0147	0.0379	1.0154	2.14
1.35	1.2210	-5.4745	0.5411	5.0362	0.0065	1.0169	0.0401	1.0177	2.26
1.40	1.2216	-5.0888	0.5566	4.9533	0.0071	1.0193	0.0423	1.0202	2.38
1.45	1.2223	-4.7422	0.5717	4.8690	0.0077	1.0219	0.0444	1.0228	2.49
1.50	1.2231	-4.4296	0.5863	4.7834	0.0084	1.0246	0.0464	1.0257	2.59
1.55	1.2240	-4.1467	0.6004	4.6966	0.0091	1.0276	0.0482	1.0287	2.69
1.60	1.2249	-3.8898	0.6141	4.6088	0.0100	1.0307	0.0499	1.0319	2.77
1.65	1.2259	-3.6559	0.6273	4.5201	0.0109	1.0340	0.0513	1.0353	2.84
1.70	1.2270	-3.4424	0.6401	4.4308	0.0119	1.0375	0.0526	1.0388	2.90
1.75	1.2282	-3.2468	0.6524	4.3409	0.0130	1.0410	0.0536	1.0424	2.95
1.80	1.2294	-3.0673	0.6642	4.2507	0.0143	1.0447	0.0544	1.0461	2.98
1.85	1.2307	-2.9022	0.6755	4.1603	0.0156	1.0485	0.0549	1.0499	3.00
1.90	1.2321	-2.7499	0.6864	4.0699	0.0171	1.0522	0.0552	1.0537	3.00
1.95	1.2336	-2.6093	0.6968	3.9795	0.0187	1.0561	0.0551	1.0575	2.99
2.00	1.2351	-2.4791	0.7067	3.8895	0.0205	1.0599	0.0548	1.0613	2.96
2.05	1.2367	-2.3584	0.7161	3.7999	0.0224	1.0636	0.0541	1.0650	2.91
2.10	1.2383	-2.2463	0.7252	3.7109	0.0245	1.0673	0.0532	1.0687	2.85
2.15	1.2400	-2.1420	0.7337	3.6227	0.0267	1.0709	0.0520	1.0722	2.78
2.20	1.2417	-2.0448	0.7419	3.5354	0.0291	1.0744	0.0506	1.0756	2.69
2.25	1.2435	-1.9542	0.7495	3.4492	0.0318	1.0777	0.0488	1.0788	2.60
2.30	1.2453	-1.8696	0.7568	3.3643	0.0346	1.0808	0.0469	1.0818	2.49
2.35	1.2471	-1.7904	0.7637	3.2806	0.0376	1.0837	0.0448	1.0846	2.37
2.40	1.2490	-1.7163	0.7702	3.1984	0.0408	1.0864	0.0424	1.0872	2.24
2.45	1.2508	-1.6469	0.7763	3.1179	0.0443	1.0888	0.0400	1.0895	2.10
2.50	1.2526	-1.5817	0.7820	3.0390	0.0479	1.0910	0.0374	1.0916	1.96
2.55	1.2544	-1.5205	0.7874	2.9619	0.0517	1.0929	0.0347	1.0935	1.82
2.60	1.2561	-1.4630	0.7925	2.8867	0.0558	1.0946	0.0319	1.0951	1.67
2.65	1.2578	-1.4089	0.7973	2.8134	0.0600	1.0961	0.0291	1.0965	1.52
2.70	1.2595	-1.3580	0.8017	2.7421	0.0644	1.0973	0.0263	1.0976	1.37
2.75	1.2610	-1.3100	0.8059	2.6729	0.0691	1.0982	0.0235	1.0985	1.23
2.80	1.2626	-1.2647	0.8098	2.6057	0.0738	1.0990	0.0207	1.0992	1.08
2.85	1.2640	-1.2220	0.8135	2.5406	0.0788	1.0995	0.0180	1.0996	0.94
2.90	1.2653	-1.1817	0.8170	2.4777	0.0839	1.0998	0.0153	1.0999	0.80
2.95	1.2666	-1.1435	0.8202	2.4167	0.0892	1.1000	0.0128	1.1001	0.67
3.00	1.2677	-1.1075	0.8232	2.3579	0.0946	1.1000	0.0103	1.1000	0.54
3.05	1.2688	-1.0733	0.8261	2.3011	0.1001	1.0998	0.0079	1.0999	0.41
3.10	1.2697	-1.0410	0.8288	2.2463	0.1058	1.0996	0.0056	1.0996	0.29
3.15	1.2706	-1.0103	0.8313	2.1935	0.1115	1.0992	0.0034	1.0992	0.18
3.20	1.2713	-0.9812	0.8337	2.1427	0.1173	1.0987	0.0013	1.0987	0.07
3.25	1.2719	-0.9536	0.8360	2.0937	0.1232	1.0981	-0.0006	1.0981	359.97
3.30	1.2725	-0.9273	0.8382	2.0466	0.1292	1.0974	-0.0025	1.0974	359.87
3.35	1.2729	-0.9024	0.8402	2.0012	0.1352	1.0967	-0.0042	1.0967	359.78
3.40	1.2732	-0.8786	0.8421	1.9575	0.1412	1.0959	-0.0059	1.0960	359.69
3.45	1.2734	-0.8560	0.8440	1.9155	0.1473	1.0951	-0.0074	1.0952	359.61
3.50	1.2735	-0.8344	0.8458	1.8752	0.1533	1.0943	-0.0089	1.0943	359.53
3.55	1.2735	-0.8139	0.8475	1.8363	0.1594	1.0934	-0.0102	1.0935	359.46
3.60	1.2734	-0.7943	0.8491	1.7989	0.1655	1.0925	-0.0115	1.0926	359.40
3.65	1.2732	-0.7755	0.8506	1.7630	0.1715	1.0916	-0.0127	1.0917	359.33
3.70	1.2729	-0.7576	0.8522	1.7284	0.1776	1.0907	-0.0138	1.0908	359.27
3.75	1.2725	-0.7405	0.8536	1.6951	0.1836	1.0898	-0.0149	1.0899	359.22
3.80	1.2721	-0.7241	0.8550	1.6630	0.1896	1.0889	-0.0158	1.0890	359.17
3.85	1.2715	-0.7084	0.8564	1.6321	0.1955	1.0879	-0.0167	1.0881	359.12
3.90	1.2709	-0.6933	0.8577	1.6024	0.2014	1.0870	-0.0176	1.0872	359.07
3.95	1.2702	-0.6789	0.8590	1.5737	0.2073	1.0861	-0.0184	1.0863	359.03

$k = 0.0$ $\sigma = 0.00$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0054	-0.0241	0.0247	257.35	0.0120	0.0986	0.0993	83.05
1.05	-0.0065	-0.0263	0.0271	256.07	0.0146	0.1084	0.1094	82.34
1.10	-0.0078	-0.0286	0.0296	254.72	0.0175	0.1185	0.1198	81.60
1.15	-0.0093	-0.0309	0.0323	253.32	0.0208	0.1291	0.1307	80.83
1.20	-0.0109	-0.0333	0.0350	251.87	0.0246	0.1399	0.1420	80.03
1.25	-0.0127	-0.0356	0.0378	250.35	0.0288	0.1510	0.1537	79.19
1.30	-0.0147	-0.0379	0.0406	248.79	0.0336	0.1624	0.1658	78.32
1.35	-0.0169	-0.0401	0.0435	247.17	0.0388	0.1740	0.1783	77.43
1.40	-0.0193	-0.0423	0.0465	245.50	0.0446	0.1858	0.1911	76.50
1.45	-0.0219	-0.0444	0.0495	243.78	0.0510	0.1977	0.2042	75.55
1.50	-0.0246	-0.0464	0.0525	242.01	0.0579	0.2098	0.2176	74.56
1.55	-0.0276	-0.0482	0.0555	240.20	0.0655	0.2218	0.2313	73.55
1.60	-0.0307	-0.0499	0.0586	238.35	0.0737	0.2339	0.2452	72.52
1.65	-0.0340	-0.0513	0.0616	236.46	0.0824	0.2459	0.2593	71.46
1.70	-0.0375	-0.0526	0.0646	234.54	0.0919	0.2578	0.2736	70.38
1.75	-0.0410	-0.0536	0.0675	232.58	0.1019	0.2694	0.2881	69.28
1.80	-0.0447	-0.0544	0.0704	230.59	0.1126	0.2809	0.3026	68.16
1.85	-0.0485	-0.0549	0.0732	228.58	0.1238	0.2920	0.3172	67.02
1.90	-0.0522	-0.0552	0.0760	226.56	0.1357	0.3028	0.3319	65.87
1.95	-0.0561	-0.0551	0.0786	224.51	0.1481	0.3132	0.3465	64.70
2.00	-0.0599	-0.0548	0.0812	222.45	0.1610	0.3232	0.3610	63.52
2.05	-0.0636	-0.0541	0.0836	220.39	0.1744	0.3326	0.3755	62.33
2.10	-0.0673	-0.0532	0.0858	218.32	0.1882	0.3414	0.3899	61.13
2.15	-0.0709	-0.0520	0.0880	216.26	0.2024	0.3497	0.4040	59.93
2.20	-0.0744	-0.0506	0.0899	214.21	0.2170	0.3573	0.4180	58.73
2.25	-0.0777	-0.0488	0.0918	212.16	0.2318	0.3642	0.4317	57.53
2.30	-0.0808	-0.0469	0.0934	210.14	0.2468	0.3705	0.4452	56.33
2.35	-0.0837	-0.0448	0.0949	208.14	0.2620	0.3761	0.4583	55.14
2.40	-0.0864	-0.0424	0.0962	206.17	0.2772	0.3809	0.4711	53.96
2.45	-0.0888	-0.0400	0.0974	204.23	0.2925	0.3851	0.4836	52.78
2.50	-0.0910	-0.0374	0.0984	202.32	0.3077	0.3886	0.4956	51.62
2.55	-0.0929	-0.0347	0.0992	200.45	0.3228	0.3913	0.5073	50.48
2.60	-0.0946	-0.0319	0.0999	198.63	0.3378	0.3935	0.5186	49.35
2.65	-0.0961	-0.0291	0.1004	196.86	0.3526	0.3950	0.5295	48.24
2.70	-0.0973	-0.0263	0.1008	195.13	0.3672	0.3959	0.5399	47.16
2.75	-0.0982	-0.0235	0.1010	193.45	0.3814	0.3962	0.5500	46.09
2.80	-0.0990	-0.0207	0.1011	191.83	0.3953	0.3960	0.5596	45.05
2.85	-0.0995	-0.0180	0.1011	190.26	0.4089	0.3953	0.5688	44.03
2.90	-0.0998	-0.0153	0.1010	188.74	0.4221	0.3942	0.5776	43.04
2.95	-0.1000	-0.0128	0.1008	187.28	0.4350	0.3927	0.5860	42.08
3.00	-0.1000	-0.0103	0.1005	185.87	0.4474	0.3908	0.5941	41.14
3.05	-0.0998	-0.0079	0.1002	184.52	0.4594	0.3886	0.6017	40.23
3.10	-0.0996	-0.0056	0.0997	183.22	0.4710	0.3861	0.6090	39.35
3.15	-0.0992	-0.0034	0.0992	181.97	0.4822	0.3834	0.6160	38.49
3.20	-0.0987	-0.0013	0.0987	180.78	0.4930	0.3805	0.6227	37.66
3.25	-0.0981	0.0006	0.0981	179.63	0.5033	0.3773	0.6291	36.86
3.30	-0.0974	0.0025	0.0975	178.54	0.5133	0.3741	0.6351	36.08
3.35	-0.0967	0.0042	0.0968	177.49	0.5229	0.3707	0.6409	35.33
3.40	-0.0959	0.0059	0.0961	176.49	0.5321	0.3672	0.6464	34.61
3.45	-0.0951	0.0074	0.0954	175.53	0.5409	0.3636	0.6517	33.91
3.50	-0.0943	0.0089	0.0947	174.61	0.5494	0.3600	0.6568	33.23
3.55	-0.0934	0.0102	0.0940	173.74	0.5575	0.3563	0.6617	32.58
3.60	-0.0925	0.0115	0.0932	172.90	0.5654	0.3526	0.6663	31.95
3.65	-0.0916	0.0127	0.0925	172.10	0.5729	0.3490	0.6708	31.35
3.70	-0.0907	0.0138	0.0917	171.33	0.5801	0.3453	0.6751	30.76
3.75	-0.0898	0.0149	0.0910	170.60	0.5871	0.3416	0.6792	30.20
3.80	-0.0889	0.0158	0.0903	169.89	0.5937	0.3380	0.6832	29.65
3.85	-0.0879	0.0167	0.0895	169.22	0.6002	0.3344	0.6870	29.12
3.90	-0.0870	0.0176	0.0888	168.57	0.6064	0.3308	0.6907	28.61
3.95	-0.0861	0.0184	0.0881	167.95	0.6124	0.3273	0.6943	28.12

$k = 0.0$	$\sigma = 0.00$								
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	1.2694	-0.6650	0.8603	1.5461	0.2131	1.0852	-0.0191	1.0854	358.99
4.05	1.2686	-0.6517	0.8615	1.5195	0.2188	1.0843	-0.0198	1.0845	358.95
4.10	1.2677	-0.6389	0.8627	1.4938	0.2245	1.0835	-0.0205	1.0837	358.92
4.15	1.2668	-0.6266	0.8639	1.4690	0.2302	1.0826	-0.0211	1.0828	358.89
4.20	1.2658	-0.6147	0.8650	1.4451	0.2357	1.0817	-0.0216	1.0820	358.86
4.25	1.2647	-0.6033	0.8661	1.4219	0.2412	1.0809	-0.0221	1.0811	358.83
4.30	1.2636	-0.5923	0.8673	1.3996	0.2467	1.0801	-0.0226	1.0803	358.80
4.35	1.2624	-0.5817	0.8683	1.3779	0.2521	1.0793	-0.0231	1.0795	358.77
4.40	1.2612	-0.5715	0.8694	1.3570	0.2574	1.0785	-0.0235	1.0787	358.75
4.45	1.2600	-0.5616	0.8705	1.3368	0.2627	1.0777	-0.0239	1.0780	358.73
4.50	1.2587	-0.5520	0.8715	1.3172	0.2679	1.0769	-0.0243	1.0772	358.71
4.55	1.2574	-0.5428	0.8725	1.2982	0.2730	1.0762	-0.0246	1.0765	358.69
4.60	1.2561	-0.5338	0.8735	1.2797	0.2781	1.0754	-0.0250	1.0757	358.67
4.65	1.2547	-0.5252	0.8745	1.2619	0.2831	1.0747	-0.0253	1.0750	358.65
4.70	1.2534	-0.5168	0.8755	1.2445	0.2881	1.0740	-0.0256	1.0743	358.64
4.75	1.2520	-0.5087	0.8765	1.2277	0.2930	1.0733	-0.0258	1.0736	358.62
4.80	1.2505	-0.5008	0.8775	1.2113	0.2978	1.0726	-0.0261	1.0729	358.61
4.85	1.2491	-0.4931	0.8784	1.1954	0.3026	1.0719	-0.0263	1.0722	358.59
4.90	1.2476	-0.4857	0.8793	1.1799	0.3073	1.0712	-0.0266	1.0716	358.58
4.95	1.2462	-0.4785	0.8803	1.1649	0.3120	1.0706	-0.0268	1.0709	358.57
5.00	1.2447	-0.4715	0.8812	1.1502	0.3166	1.0699	-0.0270	1.0703	358.56
5.05	1.2432	-0.4647	0.8821	1.1359	0.3211	1.0693	-0.0271	1.0697	358.55
5.10	1.2417	-0.4581	0.8830	1.1220	0.3256	1.0687	-0.0273	1.0690	358.54
5.15	1.2402	-0.4517	0.8839	1.1085	0.3301	1.0681	-0.0275	1.0684	358.53
5.20	1.2387	-0.4454	0.8847	1.0953	0.3345	1.0675	-0.0276	1.0678	358.52
5.25	1.2372	-0.4393	0.8856	1.0824	0.3388	1.0669	-0.0278	1.0672	358.51
5.30	1.2357	-0.4333	0.8865	1.0698	0.3431	1.0663	-0.0279	1.0667	358.50
5.35	1.2342	-0.4275	0.8873	1.0575	0.3473	1.0657	-0.0280	1.0661	358.50
5.40	1.2327	-0.4219	0.8881	1.0455	0.3515	1.0652	-0.0281	1.0655	358.49
5.45	1.2312	-0.4164	0.8890	1.0337	0.3557	1.0646	-0.0282	1.0650	358.48
5.50	1.2297	-0.4110	0.8898	1.0223	0.3598	1.0640	-0.0283	1.0644	358.48
5.55	1.2282	-0.4058	0.8906	1.0111	0.3638	1.0635	-0.0284	1.0639	358.47
5.60	1.2267	-0.4007	0.8914	1.0001	0.3678	1.0630	-0.0285	1.0634	358.47
5.65	1.2252	-0.3957	0.8922	0.9893	0.3718	1.0624	-0.0285	1.0628	358.46
5.70	1.2238	-0.3908	0.8929	0.9788	0.3757	1.0619	-0.0286	1.0623	358.46
5.75	1.2223	-0.3860	0.8937	0.9685	0.3796	1.0614	-0.0287	1.0618	358.45
5.80	1.2208	-0.3813	0.8945	0.9585	0.3835	1.0609	-0.0287	1.0613	358.45
5.85	1.2194	-0.3768	0.8952	0.9486	0.3873	1.0604	-0.0288	1.0608	358.45
5.90	1.2180	-0.3723	0.8959	0.9389	0.3910	1.0599	-0.0288	1.0603	358.44
5.95	1.2165	-0.3680	0.8967	0.9295	0.3948	1.0595	-0.0288	1.0598	358.44
6.00	1.2151	-0.3637	0.8974	0.9202	0.3985	1.0590	-0.0289	1.0594	358.44
6.05	1.2137	-0.3595	0.8981	0.9110	0.4021	1.0585	-0.0289	1.0589	358.44
6.10	1.2123	-0.3554	0.8988	0.9021	0.4057	1.0581	-0.0289	1.0584	358.44
6.15	1.2109	-0.3514	0.8995	0.8933	0.4093	1.0576	-0.0289	1.0580	358.43
6.20	1.2096	-0.3475	0.9002	0.8847	0.4128	1.0572	-0.0289	1.0575	358.43
6.25	1.2082	-0.3437	0.9009	0.8763	0.4163	1.0567	-0.0289	1.0571	358.43
6.30	1.2069	-0.3399	0.9015	0.8680	0.4198	1.0563	-0.0289	1.0567	358.43
6.35	1.2055	-0.3363	0.9022	0.8599	0.4232	1.0558	-0.0289	1.0562	358.43
6.40	1.2042	-0.3327	0.9029	0.8519	0.4266	1.0554	-0.0289	1.0558	358.43
6.45	1.2029	-0.3291	0.9035	0.8440	0.4300	1.0550	-0.0289	1.0554	358.43
6.50	1.2016	-0.3257	0.9041	0.8363	0.4333	1.0546	-0.0289	1.0550	358.43
6.55	1.2003	-0.3223	0.9048	0.8288	0.4366	1.0542	-0.0289	1.0546	358.43
6.60	1.1991	-0.3189	0.9054	0.8213	0.4398	1.0538	-0.0289	1.0542	358.43
6.65	1.1978	-0.3157	0.9060	0.8140	0.4431	1.0534	-0.0289	1.0538	358.43
6.70	1.1966	-0.3125	0.9066	0.8068	0.4463	1.0530	-0.0288	1.0534	358.43
6.75	1.1954	-0.3093	0.9072	0.7998	0.4494	1.0526	-0.0288	1.0530	358.43
6.80	1.1941	-0.3062	0.9078	0.7928	0.4526	1.0522	-0.0288	1.0526	358.43
6.85	1.1929	-0.3032	0.9084	0.7860	0.4557	1.0519	-0.0288	1.0523	358.43
6.90	1.1917	-0.3002	0.9090	0.7793	0.4587	1.0515	-0.0287	1.0519	358.44
6.95	1.1906	-0.2973	0.9095	0.7727	0.4618	1.0511	-0.0287	1.0515	358.44

$k = 0.0$ $\sigma = 0.00$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	-0.0852	0.0191	0.0873	167.35	0.6181	0.3238	0.6978	27.65
4.05	-0.0843	0.0198	0.0866	166.78	0.6237	0.3204	0.7012	27.19
4.10	-0.0835	0.0205	0.0859	166.23	0.6290	0.3170	0.7044	26.75
4.15	-0.0826	0.0211	0.0852	165.70	0.6342	0.3137	0.7076	26.32
4.20	-0.0817	0.0216	0.0846	165.19	0.6393	0.3105	0.7107	25.90
4.25	-0.0809	0.0221	0.0839	164.70	0.6441	0.3073	0.7137	25.50
4.30	-0.0801	0.0226	0.0832	164.22	0.6488	0.3041	0.7166	25.11
4.35	-0.0793	0.0231	0.0826	163.76	0.6534	0.3011	0.7194	24.74
4.40	-0.0785	0.0235	0.0819	163.32	0.6578	0.2981	0.7222	24.37
4.45	-0.0777	0.0239	0.0813	162.89	0.6621	0.2951	0.7249	24.02
4.50	-0.0769	0.0243	0.0807	162.47	0.6663	0.2922	0.7276	23.68
4.55	-0.0762	0.0246	0.0801	162.07	0.6704	0.2894	0.7302	23.35
4.60	-0.0754	0.0250	0.0795	161.68	0.6743	0.2866	0.7327	23.02
4.65	-0.0747	0.0253	0.0789	161.30	0.6782	0.2838	0.7352	22.71
4.70	-0.0740	0.0256	0.0783	160.93	0.6819	0.2812	0.7376	22.41
4.75	-0.0733	0.0258	0.0777	160.57	0.6856	0.2785	0.7400	22.11
4.80	-0.0726	0.0261	0.0771	160.23	0.6891	0.2760	0.7423	21.82
4.85	-0.0719	0.0263	0.0766	159.89	0.6926	0.2734	0.7446	21.54
4.90	-0.0712	0.0266	0.0760	159.56	0.6960	0.2710	0.7469	21.27
4.95	-0.0706	0.0268	0.0755	159.24	0.6993	0.2685	0.7491	21.01
5.00	-0.0699	0.0270	0.0750	158.92	0.7025	0.2662	0.7513	20.75
5.05	-0.0693	0.0271	0.0744	158.62	0.7058	0.2638	0.7535	20.50
5.10	-0.0687	0.0273	0.0739	158.32	0.7089	0.2615	0.7556	20.25
5.15	-0.0681	0.0275	0.0734	158.03	0.7119	0.2593	0.7576	20.01
5.20	-0.0675	0.0276	0.0729	157.74	0.7149	0.2570	0.7597	19.78
5.25	-0.0669	0.0278	0.0724	157.46	0.7178	0.2549	0.7617	19.55
5.30	-0.0663	0.0279	0.0719	157.19	0.7206	0.2527	0.7637	19.33
5.35	-0.0657	0.0280	0.0714	156.93	0.7234	0.2506	0.7656	19.11
5.40	-0.0652	0.0281	0.0710	156.67	0.7262	0.2485	0.7675	18.89
5.45	-0.0646	0.0282	0.0705	156.41	0.7289	0.2465	0.7694	18.69
5.50	-0.0640	0.0283	0.0700	156.16	0.7315	0.2445	0.7713	18.48
5.55	-0.0635	0.0284	0.0696	155.92	0.7341	0.2425	0.7731	18.28
5.60	-0.0630	0.0285	0.0691	155.68	0.7366	0.2406	0.7749	18.09
5.65	-0.0624	0.0285	0.0687	155.44	0.7391	0.2387	0.7767	17.90
5.70	-0.0619	0.0286	0.0682	155.21	0.7415	0.2368	0.7784	17.71
5.75	-0.0614	0.0287	0.0678	154.99	0.7439	0.2349	0.7802	17.53
5.80	-0.0609	0.0287	0.0673	154.77	0.7463	0.2331	0.7819	17.35
5.85	-0.0604	0.0288	0.0669	154.55	0.7486	0.2313	0.7835	17.17
5.90	-0.0599	0.0288	0.0665	154.34	0.7509	0.2295	0.7852	17.00
5.95	-0.0595	0.0288	0.0661	154.13	0.7531	0.2278	0.7868	16.83
6.00	-0.0590	0.0289	0.0657	153.93	0.7553	0.2261	0.7884	16.66
6.05	-0.0585	0.0289	0.0653	153.73	0.7575	0.2244	0.7900	16.50
6.10	-0.0581	0.0289	0.0649	153.53	0.7596	0.2227	0.7915	16.34
6.15	-0.0576	0.0289	0.0645	153.34	0.7616	0.2211	0.7931	16.18
6.20	-0.0572	0.0289	0.0641	153.15	0.7637	0.2194	0.7946	16.03
6.25	-0.0567	0.0289	0.0637	152.97	0.7657	0.2178	0.7961	15.88
6.30	-0.0563	0.0289	0.0633	152.79	0.7677	0.2162	0.7975	15.73
6.35	-0.0558	0.0289	0.0629	152.61	0.7696	0.2147	0.7990	15.59
6.40	-0.0554	0.0289	0.0625	152.43	0.7715	0.2131	0.8004	15.44
6.45	-0.0550	0.0289	0.0621	152.26	0.7734	0.2116	0.8018	15.30
6.50	-0.0546	0.0289	0.0618	152.09	0.7753	0.2101	0.8032	15.16
6.55	-0.0542	0.0289	0.0614	151.93	0.7771	0.2086	0.8046	15.03
6.60	-0.0538	0.0289	0.0611	151.76	0.7789	0.2072	0.8059	14.89
6.65	-0.0534	0.0289	0.0607	151.60	0.7806	0.2057	0.8073	14.76
6.70	-0.0530	0.0288	0.0603	151.45	0.7824	0.2043	0.8086	14.63
6.75	-0.0526	0.0288	0.0600	151.29	0.7841	0.2029	0.8099	14.51
6.80	-0.0522	0.0288	0.0596	151.14	0.7857	0.2015	0.8112	14.38
6.85	-0.0519	0.0288	0.0593	150.99	0.7874	0.2001	0.8124	14.26
6.90	-0.0515	0.0287	0.0590	150.84	0.7890	0.1988	0.8137	14.14
6.95	-0.0511	0.0287	0.0586	150.70	0.7906	0.1974	0.8149	14.02

$k = 0.0$ $\sigma = 0.00$									
a	$\frac{1-\sigma^2}{2} \cdot x$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	1.1894	-0.2945	0.9101	0.7662	0.4648	1.0508	-0.0287	1.0512	358.44
7.05	1.1882	-0.2916	0.9106	0.7598	0.4678	1.0504	-0.0286	1.0508	358.44
7.10	1.1871	-0.2889	0.9112	0.7535	0.4707	1.0501	-0.0286	1.0505	358.44
7.15	1.1860	-0.2862	0.9117	0.7473	0.4736	1.0497	-0.0285	1.0501	358.44
7.20	1.1848	-0.2835	0.9123	0.7412	0.4765	1.0494	-0.0285	1.0498	358.44
7.25	1.1837	-0.2809	0.9128	0.7353	0.4794	1.0490	-0.0284	1.0494	358.45
7.30	1.1826	-0.2783	0.9133	0.7294	0.4822	1.0487	-0.0284	1.0491	358.45
7.35	1.1816	-0.2758	0.9138	0.7236	0.4850	1.0484	-0.0283	1.0488	358.45
7.40	1.1805	-0.2733	0.9144	0.7178	0.4878	1.0481	-0.0283	1.0484	358.45
7.45	1.1794	-0.2709	0.9149	0.7122	0.4906	1.0477	-0.0282	1.0481	358.46
7.50	1.1784	-0.2685	0.9154	0.7067	0.4933	1.0474	-0.0282	1.0478	358.46
7.55	1.1773	-0.2661	0.9159	0.7012	0.4960	1.0471	-0.0281	1.0475	358.46
7.60	1.1763	-0.2638	0.9163	0.6958	0.4987	1.0468	-0.0281	1.0472	358.46
7.65	1.1753	-0.2615	0.9168	0.6905	0.5013	1.0465	-0.0280	1.0469	358.47
7.70	1.1743	-0.2592	0.9173	0.6853	0.5039	1.0462	-0.0280	1.0466	358.47
7.75	1.1733	-0.2570	0.9178	0.6802	0.5065	1.0459	-0.0279	1.0463	358.47
7.80	1.1723	-0.2549	0.9182	0.6751	0.5091	1.0456	-0.0278	1.0460	358.47
7.85	1.1713	-0.2527	0.9187	0.6701	0.5116	1.0453	-0.0278	1.0457	358.48
7.90	1.1704	-0.2506	0.9192	0.6652	0.5142	1.0450	-0.0277	1.0454	358.48
7.95	1.1694	-0.2486	0.9196	0.6604	0.5167	1.0448	-0.0277	1.0451	358.48
8.00	1.1684	-0.2465	0.9201	0.6556	0.5191	1.0445	-0.0276	1.0448	358.49
8.05	1.1675	-0.2445	0.9205	0.6509	0.5216	1.0442	-0.0275	1.0446	358.49
8.10	1.1666	-0.2425	0.9209	0.6462	0.5240	1.0439	-0.0275	1.0443	358.49
8.15	1.1657	-0.2406	0.9214	0.6417	0.5264	1.0437	-0.0274	1.0440	358.50
8.20	1.1648	-0.2387	0.9218	0.6371	0.5288	1.0434	-0.0273	1.0437	358.50
8.25	1.1639	-0.2368	0.9222	0.6327	0.5312	1.0431	-0.0273	1.0435	358.50
8.30	1.1630	-0.2349	0.9226	0.6283	0.5335	1.0429	-0.0272	1.0432	358.51
8.35	1.1621	-0.2331	0.9231	0.6240	0.5358	1.0426	-0.0272	1.0430	358.51
8.40	1.1612	-0.2313	0.9235	0.6197	0.5381	1.0424	-0.0271	1.0427	358.51
8.45	1.1603	-0.2295	0.9239	0.6155	0.5404	1.0421	-0.0270	1.0425	358.51
8.50	1.1595	-0.2278	0.9243	0.6113	0.5426	1.0419	-0.0269	1.0422	358.52
8.55	1.1586	-0.2260	0.9247	0.6072	0.5449	1.0416	-0.0269	1.0420	358.52
8.60	1.1578	-0.2244	0.9251	0.6031	0.5471	1.0414	-0.0268	1.0417	358.53
8.65	1.1570	-0.2227	0.9255	0.5991	0.5493	1.0411	-0.0267	1.0415	358.53
8.70	1.1561	-0.2210	0.9258	0.5952	0.5515	1.0409	-0.0267	1.0412	358.53
8.75	1.1553	-0.2194	0.9262	0.5913	0.5536	1.0407	-0.0266	1.0410	358.54
8.80	1.1545	-0.2178	0.9266	0.5875	0.5557	1.0404	-0.0265	1.0408	358.54
8.85	1.1537	-0.2162	0.9270	0.5837	0.5578	1.0402	-0.0265	1.0405	358.54
8.90	1.1529	-0.2147	0.9273	0.5799	0.5599	1.0400	-0.0264	1.0403	358.55
8.95	1.1521	-0.2131	0.9277	0.5762	0.5620	1.0398	-0.0263	1.0401	358.55
9.00	1.1514	-0.2116	0.9281	0.5726	0.5641	1.0395	-0.0263	1.0399	358.55
9.05	1.1506	-0.2101	0.9284	0.5690	0.5661	1.0393	-0.0262	1.0396	358.56
9.10	1.1498	-0.2086	0.9288	0.5654	0.5681	1.0391	-0.0261	1.0394	358.56
9.15	1.1491	-0.2072	0.9291	0.5619	0.5701	1.0389	-0.0261	1.0392	358.56
9.20	1.1483	-0.2057	0.9295	0.5584	0.5721	1.0387	-0.0260	1.0390	358.57
9.25	1.1476	-0.2043	0.9298	0.5550	0.5741	1.0385	-0.0259	1.0388	358.57
9.30	1.1469	-0.2029	0.9302	0.5516	0.5760	1.0383	-0.0258	1.0386	358.57
9.35	1.1461	-0.2015	0.9305	0.5482	0.5780	1.0381	-0.0258	1.0384	358.58
9.40	1.1454	-0.2002	0.9308	0.5449	0.5799	1.0378	-0.0257	1.0382	358.58
9.45	1.1447	-0.1988	0.9312	0.5416	0.5818	1.0376	-0.0256	1.0380	358.59
9.50	1.1440	-0.1975	0.9315	0.5384	0.5837	1.0374	-0.0256	1.0378	358.59
9.55	1.1433	-0.1962	0.9318	0.5352	0.5856	1.0373	-0.0255	1.0376	358.59
9.60	1.1426	-0.1949	0.9322	0.5320	0.5874	1.0371	-0.0254	1.0374	358.60
9.65	1.1419	-0.1936	0.9325	0.5289	0.5892	1.0369	-0.0253	1.0372	358.60
9.70	1.1412	-0.1924	0.9328	0.5258	0.5911	1.0367	-0.0253	1.0370	358.60
9.75	1.1406	-0.1911	0.9331	0.5228	0.5929	1.0365	-0.0252	1.0368	358.61
9.80	1.1399	-0.1899	0.9334	0.5198	0.5947	1.0363	-0.0251	1.0366	358.61
9.85	1.1392	-0.1887	0.9337	0.5168	0.5964	1.0361	-0.0251	1.0364	358.61
9.90	1.1386	-0.1875	0.9340	0.5138	0.5982	1.0359	-0.0250	1.0362	358.62
9.95	1.1379	-0.1863	0.9343	0.5109	0.5999	1.0357	-0.0249	1.0360	358.62
10.00	1.1373	-0.1851	0.9346	0.5080	0.6017	1.0356	-0.0249	1.0359	358.62

$k = 0.0$ $\sigma = 0.00$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	-0.0508	0.0287	0.0583	150.56	0.7922	0.1961	0.8161	13.91
7.05	-0.0504	0.0286	0.0580	150.42	0.7938	0.1948	0.8173	13.79
7.10	-0.0501	0.0286	0.0576	150.28	0.7953	0.1935	0.8185	13.68
7.15	-0.0497	0.0285	0.0573	150.15	0.7968	0.1923	0.8197	13.57
7.20	-0.0494	0.0285	0.0570	150.02	0.7983	0.1910	0.8208	13.46
7.25	-0.0490	0.0284	0.0567	149.89	0.7998	0.1898	0.8220	13.35
7.30	-0.0487	0.0284	0.0564	149.76	0.8012	0.1885	0.8231	13.24
7.35	-0.0484	0.0283	0.0561	149.63	0.8026	0.1873	0.8242	13.14
7.40	-0.0481	0.0283	0.0558	149.51	0.8040	0.1861	0.8253	13.04
7.45	-0.0477	0.0282	0.0555	149.39	0.8054	0.1850	0.8264	12.93
7.50	-0.0474	0.0282	0.0552	149.27	0.8068	0.1838	0.8274	12.83
7.55	-0.0471	0.0281	0.0549	149.15	0.8081	0.1826	0.8285	12.74
7.60	-0.0468	0.0281	0.0546	149.04	0.8094	0.1815	0.8295	12.64
7.65	-0.0465	0.0280	0.0543	148.92	0.8107	0.1804	0.8305	12.54
7.70	-0.0462	0.0280	0.0540	148.81	0.8120	0.1793	0.8316	12.45
7.75	-0.0459	0.0279	0.0537	148.70	0.8133	0.1782	0.8326	12.36
7.80	-0.0456	0.0278	0.0534	148.59	0.8145	0.1771	0.8336	12.27
7.85	-0.0453	0.0278	0.0532	148.48	0.8158	0.1760	0.8346	12.18
7.90	-0.0450	0.0277	0.0529	148.38	0.8170	0.1750	0.8355	12.09
7.95	-0.0448	0.0277	0.0526	148.27	0.8182	0.1739	0.8365	12.00
8.00	-0.0445	0.0276	0.0523	148.17	0.8194	0.1729	0.8374	11.91
8.05	-0.0442	0.0275	0.0521	148.07	0.8205	0.1718	0.8383	11.83
8.10	-0.0439	0.0275	0.0518	147.97	0.8217	0.1708	0.8393	11.74
8.15	-0.0437	0.0274	0.0515	147.87	0.8228	0.1698	0.8402	11.66
8.20	-0.0434	0.0273	0.0513	147.78	0.8240	0.1688	0.8411	11.58
8.25	-0.0431	0.0273	0.0510	147.68	0.8251	0.1679	0.8420	11.50
8.30	-0.0429	0.0272	0.0508	147.59	0.8262	0.1669	0.8428	11.42
8.35	-0.0426	0.0272	0.0505	147.50	0.8272	0.1659	0.8437	11.34
8.40	-0.0424	0.0271	0.0503	147.41	0.8283	0.1650	0.8446	11.27
8.45	-0.0421	0.0270	0.0500	147.32	0.8294	0.1641	0.8454	11.19
8.50	-0.0419	0.0269	0.0498	147.23	0.8304	0.1631	0.8463	11.11
8.55	-0.0416	0.0269	0.0495	147.14	0.8314	0.1622	0.8471	11.04
8.60	-0.0414	0.0268	0.0493	147.05	0.8325	0.1613	0.8479	10.97
8.65	-0.0411	0.0267	0.0491	146.97	0.8335	0.1604	0.8488	10.89
8.70	-0.0409	0.0267	0.0488	146.89	0.8344	0.1595	0.8496	10.82
8.75	-0.0407	0.0266	0.0486	146.80	0.8354	0.1586	0.8504	10.75
8.80	-0.0404	0.0265	0.0484	146.72	0.8364	0.1578	0.8511	10.68
8.85	-0.0402	0.0265	0.0481	146.64	0.8374	0.1569	0.8519	10.61
8.90	-0.0400	0.0264	0.0479	146.56	0.8383	0.1561	0.8527	10.55
8.95	-0.0398	0.0263	0.0477	146.48	0.8392	0.1552	0.8535	10.48
9.00	-0.0395	0.0263	0.0475	146.41	0.8402	0.1544	0.8542	10.41
9.05	-0.0393	0.0262	0.0472	146.33	0.8411	0.1536	0.8550	10.35
9.10	-0.0391	0.0261	0.0470	146.25	0.8420	0.1528	0.8557	10.28
9.15	-0.0389	0.0261	0.0468	146.18	0.8429	0.1520	0.8564	10.22
9.20	-0.0387	0.0260	0.0466	146.11	0.8437	0.1512	0.8572	10.16
9.25	-0.0385	0.0259	0.0464	146.03	0.8446	0.1504	0.8579	10.10
9.30	-0.0383	0.0258	0.0462	145.96	0.8455	0.1496	0.8586	10.03
9.35	-0.0381	0.0258	0.0460	145.89	0.8463	0.1488	0.8593	9.97
9.40	-0.0378	0.0257	0.0457	145.82	0.8472	0.1481	0.8600	9.91
9.45	-0.0376	0.0256	0.0455	145.75	0.8480	0.1473	0.8607	9.85
9.50	-0.0374	0.0256	0.0453	145.69	0.8488	0.1465	0.8614	9.80
9.55	-0.0373	0.0255	0.0451	145.62	0.8496	0.1458	0.8621	9.74
9.60	-0.0371	0.0254	0.0449	145.55	0.8505	0.1451	0.8627	9.68
9.65	-0.0369	0.0253	0.0447	145.49	0.8512	0.1443	0.8634	9.62
9.70	-0.0367	0.0253	0.0445	145.42	0.8520	0.1436	0.8641	9.57
9.75	-0.0365	0.0252	0.0443	145.36	0.8528	0.1429	0.8647	9.51
9.80	-0.0363	0.0251	0.0442	145.29	0.8536	0.1422	0.8654	9.46
9.85	-0.0361	0.0251	0.0440	145.23	0.8544	0.1415	0.8660	9.40
9.90	-0.0359	0.0250	0.0438	145.17	0.8551	0.1408	0.8666	9.35
9.95	-0.0357	0.0249	0.0436	145.11	0.8559	0.1401	0.8673	9.30
10.00	-0.0356	0.0249	0.0434	145.05	0.8566	0.1394	0.8679	9.25

	$k = 0.0$				$\sigma = 0.25$				
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.1011	-7.9847	0.4672	5.4762	0.0042	1.0054	0.0145	1.0055	0.83
1.05	1.1016	-7.2394	0.4872	5.3994	0.0045	1.0065	0.0157	1.0066	0.90
1.10	1.1021	-6.5932	0.5068	5.3201	0.0049	1.0078	0.0169	1.0079	0.96
1.15	1.1028	-6.0292	0.5259	5.2382	0.0053	1.0092	0.0181	1.0093	1.03
1.20	1.1034	-5.5339	0.5445	5.1540	0.0058	1.0108	0.0192	1.0109	1.09
1.25	1.1042	-5.0966	0.5626	5.0676	0.0063	1.0125	0.0203	1.0127	1.15
1.30	1.1051	-4.7086	0.5802	4.9792	0.0069	1.0144	0.0212	1.0147	1.20
1.35	1.1061	-4.3626	0.5973	4.8890	0.0075	1.0165	0.0220	1.0168	1.24
1.40	1.1072	-4.0529	0.6138	4.7969	0.0083	1.0188	0.0227	1.0190	1.27
1.45	1.1084	-3.7744	0.6298	4.7034	0.0091	1.0212	0.0232	1.0214	1.30
1.50	1.1097	-3.5231	0.6453	4.6084	0.0100	1.0237	0.0234	1.0240	1.31
1.55	1.1112	-3.2956	0.6602	4.5122	0.0110	1.0264	0.0235	1.0267	1.31
1.60	1.1127	-3.0889	0.6745	4.4150	0.0121	1.0292	0.0233	1.0295	1.30
1.65	1.1144	-2.9006	0.6883	4.3169	0.0133	1.0321	0.0228	1.0323	1.27
1.70	1.1163	-2.7285	0.7015	4.2181	0.0147	1.0350	0.0221	1.0352	1.22
1.75	1.1183	-2.5709	0.7141	4.1188	0.0163	1.0379	0.0210	1.0381	1.16
1.80	1.1204	-2.4261	0.7262	4.0192	0.0180	1.0409	0.0196	1.0410	1.08
1.85	1.1227	-2.2929	0.7377	3.9195	0.0199	1.0437	0.0179	1.0439	0.98
1.90	1.1250	-2.1700	0.7486	3.8199	0.0219	1.0465	0.0158	1.0466	0.87
1.95	1.1276	-2.0564	0.7589	3.7206	0.0242	1.0492	0.0134	1.0493	0.73
2.00	1.1302	-1.9513	0.7686	3.6218	0.0267	1.0516	0.0108	1.0517	0.59
2.05	1.1330	-1.8538	0.7778	3.5237	0.0295	1.0539	0.0078	1.0539	0.42
2.10	1.1358	-1.7633	0.7865	3.4266	0.0325	1.0559	0.0045	1.0559	0.25
2.15	1.1388	-1.6791	0.7946	3.3306	0.0358	1.0576	0.0011	1.0576	0.06
2.20	1.1418	-1.6007	0.8022	3.2361	0.0393	1.0590	-0.0026	1.0590	359.86
2.25	1.1449	-1.5277	0.8093	3.1430	0.0432	1.0600	-0.0064	1.0600	359.65
2.30	1.1480	-1.4595	0.8158	3.0518	0.0473	1.0607	-0.0104	1.0608	359.44
2.35	1.1512	-1.3958	0.8219	2.9624	0.0517	1.0610	-0.0144	1.0611	359.22
2.40	1.1543	-1.3362	0.8276	2.8752	0.0564	1.0610	-0.0184	1.0612	359.01
2.45	1.1575	-1.2805	0.8328	2.7902	0.0614	1.0606	-0.0224	1.0609	358.79
2.50	1.1606	-1.2283	0.8376	2.7075	0.0667	1.0599	-0.0263	1.0602	358.58
2.55	1.1637	-1.1794	0.8421	2.6273	0.0723	1.0589	-0.0301	1.0593	358.37
2.60	1.1667	-1.1335	0.8462	2.5497	0.0781	1.0575	-0.0338	1.0581	358.17
2.65	1.1696	-1.0904	0.8499	2.4746	0.0842	1.0559	-0.0373	1.0566	357.98
2.70	1.1724	-1.0499	0.8534	2.4022	0.0905	1.0541	-0.0406	1.0549	357.79
2.75	1.1751	-1.0119	0.8566	2.3324	0.0971	1.0521	-0.0437	1.0530	357.62
2.80	1.1777	-0.9761	0.8595	2.2653	0.1038	1.0499	-0.0466	1.0509	357.46
2.85	1.1802	-0.9423	0.8622	2.2007	0.1107	1.0476	-0.0493	1.0487	357.31
2.90	1.1825	-0.9105	0.8647	2.1388	0.1178	1.0451	-0.0518	1.0464	357.16
2.95	1.1847	-0.8805	0.8670	2.0794	0.1250	1.0426	-0.0540	1.0440	357.03
3.00	1.1867	-0.8522	0.8691	2.0224	0.1323	1.0400	-0.0560	1.0415	356.92
3.05	1.1886	-0.8255	0.8711	1.9678	0.1398	1.0374	-0.0579	1.0390	356.81
3.10	1.1903	-0.8002	0.8729	1.9156	0.1473	1.0347	-0.0595	1.0364	356.71
3.15	1.1919	-0.7762	0.8746	1.8656	0.1548	1.0321	-0.0609	1.0339	356.62
3.20	1.1934	-0.7536	0.8763	1.8177	0.1624	1.0295	-0.0622	1.0313	356.54
3.25	1.1947	-0.7321	0.8778	1.7719	0.1700	1.0269	-0.0633	1.0288	356.47
3.30	1.1959	-0.7117	0.8792	1.7281	0.1776	1.0243	-0.0643	1.0263	356.41
3.35	1.1969	-0.6923	0.8805	1.6862	0.1852	1.0218	-0.0651	1.0239	356.35
3.40	1.1978	-0.6739	0.8818	1.6461	0.1928	1.0193	-0.0658	1.0214	356.31
3.45	1.1986	-0.6564	0.8830	1.6077	0.2003	1.0169	-0.0664	1.0191	356.26
3.50	1.1993	-0.6397	0.8841	1.5709	0.2079	1.0146	-0.0669	1.0168	356.23
3.55	1.1998	-0.6238	0.8853	1.5357	0.2153	1.0123	-0.0673	1.0145	356.20
3.60	1.2002	-0.6086	0.8863	1.5020	0.2227	1.0100	-0.0676	1.0123	356.17
3.65	1.2006	-0.5942	0.8873	1.4697	0.2300	1.0079	-0.0678	1.0102	356.15
3.70	1.2008	-0.5804	0.8883	1.4387	0.2372	1.0058	-0.0680	1.0081	356.13
3.75	1.2009	-0.5671	0.8893	1.4090	0.2444	1.0037	-0.0681	1.0061	356.12
3.80	1.2010	-0.5545	0.8902	1.3805	0.2514	1.0018	-0.0681	1.0041	356.11
3.85	1.2009	-0.5424	0.8911	1.3532	0.2584	0.9999	-0.0681	1.0022	356.10
3.90	1.2008	-0.5308	0.8920	1.3269	0.2653	0.9980	-0.0681	1.0003	356.10
3.95	1.2005	-0.5197	0.8929	1.3016	0.2721	0.9962	-0.0680	0.9985	356.09

k = 0.0 σ = 0.25								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0054	-0.0145	0.0155	249.64	0.0132	0.1080	0.1088	83.03
1.05	-0.0065	-0.0157	0.0170	247.57	0.0160	0.1187	0.1198	82.32
1.10	-0.0078	-0.0169	0.0186	245.39	0.0192	0.1299	0.1313	81.57
1.15	-0.0092	-0.0181	0.0203	243.12	0.0229	0.1414	0.1433	80.79
1.20	-0.0108	-0.0192	0.0220	240.76	0.0271	0.1533	0.1557	79.97
1.25	-0.0125	-0.0203	0.0238	238.30	0.0318	0.1656	0.1686	79.12
1.30	-0.0144	-0.0212	0.0256	235.75	0.0371	0.1781	0.1819	78.24
1.35	-0.0165	-0.0220	0.0275	233.10	0.0429	0.1909	0.1957	77.33
1.[illegible]	-0.0188	-0.0227	0.0294	230.37	0.0494	0.2039	0.2098	76.38
1.45	-0.0212	-0.0232	0.0314	227.55	0.0566	0.2171	0.2243	75.40
1.50	-0.0237	-0.0234	0.0334	224.65	0.0644	0.2304	0.2392	74.38
1.55	-0.0264	-0.0235	0.0353	221.66	0.0729	0.2437	0.2544	73.34
1.60	-0.0292	-0.0233	0.0374	218.59	0.0822	0.2570	0.2698	72.27
1.65	-0.0321	-0.0228	0.0394	215.45	0.0922	0.2702	0.2855	71.16
1.70	-0.0350	-0.0221	0.0414	212.24	0.1029	0.2833	0.3014	70.03
1.75	-0.0379	-0.0210	0.0434	208.97	0.1144	0.2961	0.3175	68.88
1.80	-0.0409	-0.0196	0.0453	205.63	0.1267	0.3087	0.3337	67.69
1.85	-0.0437	-0.0179	0.0473	202.23	0.1396	0.3209	0.3499	66.49
1.90	-0.0465	-0.0158	0.0491	198.79	0.1533	0.3326	0.3662	65.26
1.95	-0.0492	-0.0134	0.0510	195.30	0.1676	0.3438	0.3825	64.01
2.00	-0.0516	-0.0108	0.0527	191.77	0.1826	0.3544	0.3986	62.74
2.05	-0.0539	-0.0078	0.0544	188.22	0.1981	0.3643	0.4147	61.47
2.10	-0.0559	-0.0045	0.0561	184.65	0.2141	0.3735	0.4305	60.18
2.15	-0.0576	-0.0011	0.0576	181.06	0.2306	0.3819	0.4461	58.88
2.20	-0.0590	0.0026	0.0590	177.47	0.2474	0.3895	0.4614	57.58
2.25	-0.0600	0.0064	0.0604	173.88	0.2645	0.3962	0.4764	56.27
2.30	-0.0607	0.0104	0.0616	170.31	0.2818	0.4020	0.4909	54.97
2.35	-0.0610	0.0144	0.0627	166.75	0.2992	0.4069	0.5051	53.68
2.40	-0.0610	0.0184	0.0637	163.23	0.3166	0.4110	0.5188	52.39
2.45	-0.0606	0.0224	0.0646	159.75	0.3339	0.4141	0.5319	51.12
2.50	-0.0599	0.0263	0.0654	156.31	0.3511	0.4164	0.5446	49.87
2.55	-0.0589	0.0301	0.0661	152.92	0.3680	0.4178	0.5568	48.63
2.60	-0.0575	0.0338	0.0667	149.59	0.3846	0.4185	0.5684	47.42
2.65	-0.0559	0.0373	0.0672	146.32	0.4009	0.4184	0.5795	46.23
2.70	-0.0541	0.0406	0.0677	143.12	0.4167	0.4177	0.5900	45.07
2.75	-0.0521	0.0437	0.0680	140.00	0.4321	0.4163	0.6000	43.94
2.80	-0.0499	0.0466	0.0683	136.95	0.4470	0.4144	0.6095	42.84
2.85	-0.0476	0.0493	0.0685	133.97	0.4613	0.4120	0.6185	41.77
2.90	-0.0451	0.0518	0.0687	131.07	0.4752	0.4091	0.6270	40.73
2.95	-0.0426	0.0540	0.0688	128.25	0.4885	0.4059	0.6351	39.73
3.00	-0.0400	0.0560	0.0688	125.51	0.5012	0.4023	0.6427	38.75
3.05	-0.0374	0.0579	0.0689	122.85	0.5134	0.3985	0.6499	37.82
3.10	-0.0347	0.0595	0.0689	120.27	0.5251	0.3944	0.6567	36.91
3.15	-0.0321	0.0609	0.0689	117.77	0.5363	0.3901	0.6632	36.04
3.20	-0.0295	0.0622	0.0688	115.34	0.5469	0.3857	0.6693	35.20
3.25	-0.0269	0.0633	0.0688	112.98	0.5571	0.3812	0.6750	34.39
3.30	-0.0243	0.0643	0.0687	110.70	0.5668	0.3767	0.6805	33.61
3.35	-0.0218	0.0651	0.0687	108.49	0.5760	0.3720	0.6857	32.86
3.40	-0.0193	0.0658	0.0686	106.36	0.5849	0.3674	0.6907	32.13
3.45	-0.0169	0.0664	0.0685	104.28	0.5933	0.3627	0.6954	31.44
3.50	-0.0146	0.0669	0.0684	102.28	0.6013	0.3580	0.6998	30.77
3.55	-0.0123	0.0673	0.0684	100.33	0.6090	0.3534	0.7041	30.13
3.60	-0.0100	0.0676	0.0683	98.45	0.6163	0.3489	0.7082	29.51
3.65	-0.0079	0.0678	0.0683	96.63	0.6233	0.3443	0.7121	28.92
3.70	-0.0058	0.0680	0.0682	94.86	0.6300	0.3399	0.7158	28.35
3.75	-0.0037	0.0681	0.0682	93.15	0.6364	0.3355	0.7194	27.79
3.80	-0.0018	0.0681	0.0681	91.49	0.6426	0.3312	0.7229	27.27
3.85	0.0001	0.0681	0.0681	89.88	0.6485	0.3269	0.7262	26.76
3.90	0.0020	0.0681	0.0681	88.33	0.6541	0.3228	0.7294	26.26
3.95	0.0038	0.0680	0.0681	86.82	0.6595	0.3187	0.7325	25.79

$k = 0.0$ $\sigma = 0.25$										
a	$\frac{1-\sigma^2}{2} \cdot X$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$				
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	1.2003	-0.5091	0.8937	1.2774	0.2788	0.9945	-0.0679	0.9968	356.09
4.05	1.1999	-0.4988	0.8945	1.2540	0.2854	0.9928	-0.0678	0.9951	356.10
4.10	1.1995	-0.4890	0.8954	1.2315	0.2919	0.9912	-0.0676	0.9935	356.10
4.15	1.1990	-0.4795	0.8962	1.2098	0.2982	0.9896	-0.0674	0.9919	356.10
4.20	1.1984	-0.4704	0.8970	1.1890	0.3045	0.9880	-0.0672	0.9903	356.11
4.25	1.1979	-0.4616	0.8977	1.1688	0.3107	0.9865	-0.0670	0.9888	356.12
4.30	1.1972	-0.4532	0.8985	1.1494	0.3168	0.9851	-0.0668	0.9874	356.12
4.35	1.1965	-0.4450	0.8993	1.1307	0.3228	0.9837	-0.0665	0.9859	356.13
4.40	1.1958	-0.4372	0.9000	1.1126	0.3287	0.9823	-0.0662	0.9846	356.14
4.45	1.1950	-0.4296	0.9008	1.0951	0.3345	0.9810	-0.0660	0.9832	356.15
4.50	1.1942	-0.4223	0.9015	1.0781	0.3402	0.9797	-0.0657	0.9819	356.16
4.55	1.1934	-0.4152	0.9022	1.0617	0.3459	0.9784	-0.0654	0.9806	356.17
4.60	1.1925	-0.4083	0.9030	1.0459	0.3514	0.9772	-0.0651	0.9794	356.19
4.65	1.1916	-0.4017	0.9037	1.0305	0.3568	0.9760	-0.0649	0.9782	356.20
4.70	1.1906	-0.3952	0.9044	1.0156	0.3622	0.9749	-0.0646	0.9770	356.21
4.75	1.1897	-0.3890	0.9051	1.0012	0.3675	0.9737	-0.0643	0.9758	356.22
4.80	1.1887	-0.3830	0.9058	0.9871	0.3726	0.9726	-0.0640	0.9747	356.24
4.85	1.1877	-0.3771	0.9065	0.9735	0.3778	0.9715	-0.0637	0.9736	356.25
4.90	1.1867	-0.3714	0.9072	0.9603	0.3828	0.9705	-0.0634	0.9725	356.26
4.95	1.1857	-0.3659	0.9079	0.9474	0.3877	0.9694	-0.0630	0.9715	356.28
5.00	1.1847	-0.3605	0.9085	0.9349	0.3926	0.9684	-0.0627	0.9705	356.29
5.05	1.1836	-0.3553	0.9092	0.9227	0.3974	0.9674	-0.0624	0.9695	356.31
5.10	1.1826	-0.3502	0.9099	0.9109	0.4022	0.9665	-0.0621	0.9685	356.32
5.15	1.1815	-0.3453	0.9105	0.8994	0.4068	0.9655	-0.0618	0.9675	356.34
5.20	1.1804	-0.3405	0.9112	0.8881	0.4114	0.9646	-0.0615	0.9666	356.35
5.25	1.1793	-0.3358	0.9118	0.8772	0.4160	0.9637	-0.0612	0.9656	356.37
5.30	1.1783	-0.3313	0.9125	0.8665	0.4204	0.9628	-0.0609	0.9647	356.38
5.35	1.1772	-0.3268	0.9131	0.8560	0.4248	0.9619	-0.0606	0.9638	356.40
5.40	1.1761	-0.3225	0.9137	0.8459	0.4292	0.9611	-0.0603	0.9630	356.41
5.45	1.1750	-0.3183	0.9143	0.8359	0.4335	0.9603	-0.0600	0.9621	356.43
5.50	1.1739	-0.3142	0.9149	0.8262	0.4377	0.9594	-0.0597	0.9613	356.44
5.55	1.1728	-0.3102	0.9155	0.8168	0.4419	0.9586	-0.0594	0.9605	356.46
5.60	1.1718	-0.3062	0.9161	0.8075	0.4460	0.9578	-0.0591	0.9597	356.47
5.65	1.1707	-0.3024	0.9167	0.7984	0.4500	0.9571	-0.0588	0.9589	356.49
5.70	1.1696	-0.2987	0.9173	0.7896	0.4540	0.9563	-0.0585	0.9581	356.50
5.75	1.1685	-0.2950	0.9179	0.7809	0.4580	0.9555	-0.0582	0.9573	356.52
5.80	1.1675	-0.2914	0.9185	0.7724	0.4619	0.9548	-0.0579	0.9566	356.53
5.85	1.1664	-0.2880	0.9190	0.7641	0.4657	0.9541	-0.0576	0.9558	356.55
5.90	1.1654	-0.2845	0.9196	0.7560	0.4695	0.9534	-0.0573	0.9551	356.56
5.95	1.1643	-0.2812	0.9202	0.7480	0.4733	0.9527	-0.0570	0.9544	356.58
6.00	1.1633	-0.2779	0.9207	0.7402	0.4770	0.9520	-0.0567	0.9537	356.59
6.05	1.1622	-0.2748	0.9213	0.7326	0.4807	0.9513	-0.0564	0.9530	356.61
6.10	1.1612	-0.2716	0.9218	0.7251	0.4843	0.9507	-0.0561	0.9523	356.62
6.15	1.1602	-0.2686	0.9223	0.7177	0.4879	0.9500	-0.0558	0.9517	356.64
6.20	1.1592	-0.2656	0.9228	0.7105	0.4914	0.9494	-0.0556	0.9510	356.65
6.25	1.1582	-0.2626	0.9234	0.7035	0.4949	0.9487	-0.0553	0.9504	356.67
6.30	1.1572	-0.2598	0.9239	0.6966	0.4983	0.9481	-0.0550	0.9497	356.68
6.35	1.1562	-0.2570	0.9244	0.6898	0.5017	0.9475	-0.0547	0.9491	356.70
6.40	1.1552	-0.2542	0.9249	0.6831	0.5051	0.9469	-0.0544	0.9485	356.71
6.45	1.1543	-0.2515	0.9254	0.6766	0.5084	0.9463	-0.0541	0.9479	356.73
6.50	1.1533	-0.2488	0.9259	0.6701	0.5116	0.9458	-0.0539	0.9473	356.74
6.55	1.1523	-0.2462	0.9263	0.6638	0.5149	0.9452	-0.0536	0.9467	356.75
6.60	1.1514	-0.2437	0.9268	0.6576	0.5181	0.9446	-0.0533	0.9461	356.77
6.65	1.1505	-0.2412	0.9273	0.6516	0.5212	0.9441	-0.0531	0.9456	356.78
6.70	1.1495	-0.2387	0.9278	0.6456	0.5244	0.9435	-0.0528	0.9450	356.80
6.75	1.1486	-0.2363	0.9282	0.6397	0.5274	0.9430	-0.0525	0.9445	356.81
6.80	1.1477	-0.2340	0.9287	0.6339	0.5305	0.9425	-0.0522	0.9439	356.83
6.85	1.1468	-0.2317	0.9291	0.6283	0.5335	0.9419	-0.0520	0.9434	356.84
6.90	1.1459	-0.2294	0.9296	0.6227	0.5365	0.9414	-0.0517	0.9429	356.86
6.95	1.1450	-0.2272	0.9300	0.6172	0.5394	0.9409	-0.0515	0.9423	356.87

	$k = 0.0$				$\sigma = 0.25$			
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.0055	0.0679	0.0681	85.35	0.6648	0.3147	0.7355	25.33
4.05	0.0072	0.0678	0.0681	83.93	0.6698	0.3108	0.7384	24.89
4.10	0.0088	0.0676	0.0682	82.55	0.6746	0.3070	0.7412	24.47
4.15	0.0104	0.0674	0.0682	81.21	0.6793	0.3033	0.7439	24.06
4.20	0.0120	0.0672	0.0683	79.91	0.6838	0.2997	0.7466	23.66
4.25	0.0135	0.0670	0.0683	78.64	0.6882	0.2961	0.7492	23.28
4.30	0.0149	0.0668	0.0684	77.41	0.6924	0.2926	0.7517	22.91
4.35	0.0163	0.0665	0.0685	76.22	0.6965	0.2893	0.7541	22.56
4.40	0.0177	0.0662	0.0686	75.06	0.7004	0.2860	0.7565	22.21
4.45	0.0190	0.0660	0.0687	73.93	0.7042	0.2827	0.7589	21.87
4.50	0.0203	0.0657	0.0688	72.83	0.7080	0.2796	0.7612	21.55
4.55	0.0216	0.0654	0.0689	71.76	0.7116	0.2765	0.7634	21.24
4.60	0.0228	0.0651	0.0690	70.72	0.7151	0.2735	0.7656	20.93
4.65	0.0240	0.0649	0.0691	69.71	0.7185	0.2706	0.7677	20.64
4.70	0.0251	0.0646	0.0693	68.72	0.7218	0.2677	0.7699	20.35
4.75	0.0263	0.0643	0.0694	67.76	0.7250	0.2649	0.7719	20.07
4.80	0.0274	0.0640	0.0696	66.82	0.7282	0.2622	0.7740	19.80
4.85	0.0285	0.0637	0.0697	65.91	0.7313	0.2595	0.7759	19.54
4.90	0.0295	0.0634	0.0699	65.01	0.7343	0.2569	0.7779	19.28
4.95	0.0306	0.0630	0.0701	64.14	0.7372	0.2543	0.7798	19.03
5.00	0.0316	0.0627	0.0702	63.29	0.7401	0.2518	0.7817	18.79
5.05	0.0326	0.0624	0.0704	62.46	0.7429	0.2493	0.7836	18.55
5.10	0.0335	0.0621	0.0706	61.65	0.7456	0.2469	0.7854	18.32
5.15	0.0345	0.0618	0.0708	60.86	0.7483	0.2446	0.7872	18.10
5.20	0.0354	0.0615	0.0710	60.09	0.7509	0.2423	0.7890	17.88
5.25	0.0363	0.0612	0.0712	59.33	0.7535	0.2400	0.7908	17.67
5.30	0.0372	0.0609	0.0714	58.59	0.7560	0.2378	0.7925	17.46
5.35	0.0381	0.0606	0.0716	57.87	0.7584	0.2356	0.7942	17.26
5.40	0.0389	0.0603	0.0718	57.16	0.7608	0.2334	0.7958	17.06
5.45	0.0397	0.0600	0.0720	56.47	0.7632	0.2313	0.7975	16.86
5.50	0.0406	0.0597	0.0722	55.80	0.7655	0.2293	0.7991	16.67
5.55	0.0414	0.0594	0.0724	55.13	0.7678	0.2273	0.8007	16.49
5.60	0.0422	0.0591	0.0726	54.49	0.7700	0.2253	0.8023	16.31
5.65	0.0429	0.0588	0.0728	53.85	0.7722	0.2233	0.8038	16.13
5.70	0.0437	0.0585	0.0730	53.23	0.7743	0.2214	0.8054	15.96
5.75	0.0445	0.0582	0.0732	52.62	0.7764	0.2195	0.8069	15.79
5.80	0.0452	0.0579	0.0734	52.02	0.7785	0.2176	0.8083	15.62
5.85	0.0459	0.0576	0.0736	51.44	0.7805	0.2158	0.8098	15.46
5.90	0.0466	0.0573	0.0739	50.87	0.7825	0.2140	0.8113	15.30
5.95	0.0473	0.0570	0.0741	50.31	0.7845	0.2123	0.8127	15.14
6.00	0.0480	0.0567	0.0743	49.76	0.7864	0.2105	0.8141	14.99
6.05	0.0487	0.0564	0.0745	49.22	0.7883	0.2088	0.8155	14.84
6.10	0.0493	0.0561	0.0747	48.69	0.7901	0.2071	0.8168	14.69
6.15	0.0500	0.0558	0.0749	48.17	0.7919	0.2055	0.8182	14.54
6.20	0.0506	0.0556	0.0752	47.66	0.7937	0.2038	0.8195	14.40
6.25	0.0513	0.0553	0.0754	47.16	0.7955	0.2022	0.8208	14.26
6.30	0.0519	0.0550	0.0756	46.67	0.7972	0.2006	0.8221	14.13
6.35	0.0525	0.0547	0.0758	46.19	0.7989	0.1991	0.8234	13.99
6.40	0.0531	0.0544	0.0760	45.72	0.8006	0.1975	0.8246	13.86
6.45	0.0537	0.0541	0.0762	45.26	0.8022	0.1960	0.8258	13.73
6.50	0.0542	0.0539	0.0764	44.80	0.8039	0.1945	0.8271	13.60
6.55	0.0548	0.0536	0.0767	44.36	0.8054	0.1931	0.8283	13.48
6.60	0.0554	0.0533	0.0769	43.92	0.8070	0.1916	0.8294	13.36
6.65	0.0559	0.0531	0.0771	43.49	0.8085	0.1902	0.8306	13.24
6.70	0.0565	0.0528	0.0773	43.07	0.8101	0.1888	0.8318	13.12
6.75	0.0570	0.0525	0.0775	42.65	0.8115	0.1874	0.8329	13.00
6.80	0.0575	0.0522	0.0777	42.24	0.8130	0.1860	0.8340	12.89
6.85	0.0581	0.0520	0.0779	41.84	0.8145	0.1847	0.8351	12.77
6.90	0.0586	0.0517	0.0781	41.45	0.8159	0.1833	0.8362	12.66
6.95	0.0591	0.0515	0.0783	41.06	0.8173	0.1820	0.8373	12.55

$k = 0.0$ $\sigma = 0.25$									
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	1.1442	-0.2250	0.9304	0.6119	0.5423	0.9404	-0.0512	0.9418	356.88
7.05	1.1433	-0.2228	0.9309	0.6066	0.5452	0.9400	-0.0509	0.9413	356.90
7.10	1.1424	-0.2207	0.9313	0.6014	0.5481	0.9395	-0.0507	0.9408	356.91
7.15	1.1416	-0.2186	0.9317	0.5963	0.5509	0.9390	-0.0504	0.9404	356.93
7.20	1.1408	-0.2166	0.9321	0.5912	0.5536	0.9385	-0.0502	0.9399	356.94
7.25	1.1399	-0.2146	0.9325	0.5863	0.5564	0.9381	-0.0499	0.9394	356.95
7.30	1.1391	-0.2126	0.9329	0.5814	0.5591	0.9376	-0.0497	0.9389	356.97
7.35	1.1383	-0.2107	0.9333	0.5766	0.5618	0.9372	-0.0494	0.9385	356.98
7.40	1.1375	-0.2088	0.9337	0.5719	0.5645	0.9367	-0.0492	0.9380	356.99
7.45	1.1367	-0.2069	0.9341	0.5673	0.5671	0.9363	-0.0489	0.9376	357.01
7.50	1.1359	-0.2051	0.9345	0.5627	0.5697	0.9359	-0.0487	0.9371	357.02
7.55	1.1351	-0.2033	0.9349	0.5582	0.5722	0.9354	-0.0485	0.9367	357.03
7.60	1.1343	-0.2015	0.9353	0.5538	0.5748	0.9350	-0.0482	0.9363	357.05
7.65	1.1336	-0.1998	0.9356	0.5494	0.5773	0.9346	-0.0480	0.9359	357.06
7.70	1.1328	-0.1981	0.9360	0.5451	0.5798	0.9342	-0.0478	0.9354	357.07
7.75	1.1321	-0.1964	0.9364	0.5409	0.5822	0.9338	-0.0475	0.9350	357.09
7.80	1.1313	-0.1947	0.9367	0.5367	0.5846	0.9334	-0.0473	0.9346	357.10
7.85	1.1306	-0.1931	0.9371	0.5326	0.5871	0.9330	-0.0471	0.9342	357.11
7.90	1.1299	-0.1915	0.9374	0.5286	0.5894	0.9327	-0.0468	0.9338	357.13
7.95	1.1291	-0.1899	0.9378	0.5246	0.5918	0.9323	-0.0466	0.9334	357.14
8.00	1.1284	-0.1883	0.9381	0.5207	0.5941	0.9319	-0.0464	0.9331	357.15
8.05	1.1277	-0.1868	0.9385	0.5168	0.5964	0.9315	-0.0462	0.9327	357.16
8.10	1.1270	-0.1853	0.9388	0.5130	0.5987	0.9312	-0.0459	0.9323	357.17
8.15	1.1263	-0.1838	0.9391	0.5093	0.6009	0.9308	-0.0457	0.9319	357.19
8.20	1.1256	-0.1823	0.9395	0.5056	0.6032	0.9305	-0.0455	0.9316	357.20
8.25	1.1250	-0.1809	0.9398	0.5019	0.6054	0.9301	-0.0453	0.9312	357.21
8.30	1.1243	-0.1795	0.9401	0.4983	0.6075	0.9298	-0.0451	0.9309	357.22
8.35	1.1236	-0.1781	0.9405	0.4948	0.6097	0.9294	-0.0449	0.9305	357.24
8.40	1.1230	-0.1767	0.9408	0.4913	0.6118	0.9291	-0.0447	0.9302	357.25
8.45	1.1223	-0.1753	0.9411	0.4879	0.6139	0.9287	-0.0445	0.9298	357.26
8.50	1.1217	-0.1740	0.9414	0.4845	0.6160	0.9284	-0.0443	0.9295	357.27
8.55	1.1210	-0.1727	0.9417	0.4811	0.6181	0.9281	-0.0441	0.9291	357.28
8.60	1.1204	-0.1714	0.9420	0.4778	0.6201	0.9278	-0.0438	0.9288	357.29
8.65	1.1198	-0.1701	0.9423	0.4745	0.6222	0.9275	-0.0436	0.9285	357.31
8.70	1.1191	-0.1689	0.9426	0.4713	0.6242	0.9271	-0.0434	0.9282	357.32
8.75	1.1185	-0.1676	0.9429	0.4681	0.6262	0.9268	-0.0433	0.9278	357.33
8.80	1.1179	-0.1664	0.9432	0.4650	0.6281	0.9265	-0.0431	0.9275	357.34
8.85	1.1173	-0.1652	0.9435	0.4619	0.6301	0.9262	-0.0429	0.9272	357.35
8.90	1.1167	-0.1640	0.9438	0.4589	0.6320	0.9259	-0.0427	0.9269	357.36
8.95	1.1161	-0.1628	0.9441	0.4558	0.6339	0.9256	-0.0425	0.9266	357.37
9.00	1.1155	-0.1616	0.9443	0.4529	0.6358	0.9253	-0.0423	0.9263	357.38
9.05	1.1150	-0.1605	0.9446	0.4499	0.6377	0.9251	-0.0421	0.9260	357.39
9.10	1.1144	-0.1594	0.9449	0.4470	0.6395	0.9248	-0.0419	0.9257	357.41
9.15	1.1138	-0.1583	0.9452	0.4442	0.6414	0.9245	-0.0417	0.9254	357.42
9.20	1.1132	-0.1572	0.9454	0.4414	0.6432	0.9242	-0.0415	0.9252	357.43
9.25	1.1127	-0.1561	0.9457	0.4386	0.6450	0.9239	-0.0414	0.9249	357.44
9.30	1.1121	-0.1550	0.9460	0.4358	0.6467	0.9237	-0.0412	0.9246	357.45
9.35	1.1116	-0.1540	0.9462	0.4331	0.6485	0.9234	-0.0410	0.9243	357.46
9.40	1.1110	-0.1529	0.9465	0.4304	0.6503	0.9231	-0.0408	0.9240	357.47
9.45	1.1105	-0.1519	0.9467	0.4277	0.6520	0.9229	-0.0406	0.9238	357.48
9.50	1.1099	-0.1509	0.9470	0.4251	0.6537	0.9226	-0.0405	0.9235	357.49
9.55	1.1094	-0.1499	0.9473	0.4225	0.6554	0.9224	-0.0403	0.9232	357.50
9.60	1.1089	-0.1489	0.9475	0.4200	0.6571	0.9221	-0.0401	0.9230	357.51
9.65	1.1084	-0.1479	0.9478	0.4174	0.6587	0.9219	-0.0400	0.9227	357.52
9.70	1.1079	-0.1470	0.9480	0.4149	0.6604	0.9216	-0.0398	0.9225	357.53
9.75	1.1073	-0.1460	0.9482	0.4125	0.6620	0.9214	-0.0396	0.9222	357.54
9.80	1.1068	-0.1451	0.9485	0.4100	0.6636	0.9211	-0.0394	0.9220	357.55
9.85	1.1063	-0.1441	0.9487	0.4076	0.6652	0.9209	-0.0393	0.9217	357.56
9.90	1.1058	-0.1432	0.9490	0.4052	0.6668	0.9206	-0.0391	0.9215	357.57
9.95	1.1053	-0.1423	0.9492	0.4028	0.6684	0.9204	-0.0390	0.9212	357.58
10.00	1.1048	-0.1414	0.9494	0.4005	0.6700	0.9202	-0.0388	0.9210	357.59

$k = 0.0$ $\sigma = 0.25$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.0596	0.0512	0.0785	40.68	0.8187	0.1807	0.8384	12.45
7.05	0.0600	0.0509	0.0787	40.31	0.8200	0.1794	0.8394	12.34
7.10	0.0605	0.0507	0.0789	39.94	0.8213	0.1782	0.8404	12.24
7.15	0.0610	0.0504	0.0791	39.58	0.8227	0.1769	0.8415	12.14
7.20	0.0615	0.0502	0.0793	39.22	0.8240	0.1757	0.8425	12.04
7.25	0.0619	0.0499	0.0795	38.88	0.8252	0.1745	0.8435	11.94
7.30	0.0624	0.0497	0.0797	38.53	0.8265	0.1733	0.8445	11.84
7.35	0.0628	0.0494	0.0799	38.19	0.8277	0.1721	0.8454	11.75
7.40	0.0633	0.0492	0.0801	37.86	0.8290	0.1710	0.8464	11.65
7.45	0.0637	0.0489	0.0803	37.53	0.8302	0.1698	0.8473	11.56
7.50	0.0641	0.0487	0.0805	37.21	0.8313	0.1687	0.8483	11.47
7.55	0.0646	0.0485	0.0807	36.90	0.8325	0.1675	0.8492	11.38
7.60	0.0650	0.0482	0.0809	36.59	0.8337	0.1664	0.8501	11.29
7.65	0.0654	0.0480	0.0811	36.28	0.8348	0.1654	0.8510	11.20
7.70	0.0658	0.0478	0.0813	35.98	0.8359	0.1643	0.8519	11.12
7.75	0.0662	0.0475	0.0815	35.68	0.8370	0.1632	0.8528	11.03
7.80	0.0666	0.0473	0.0817	35.39	0.8381	0.1622	0.8537	10.95
7.85	0.0670	0.0471	0.0819	35.10	0.8392	0.1611	0.8545	10.87
7.90	0.0673	0.0468	0.0820	34.82	0.8403	0.1601	0.8554	10.79
7.95	0.0677	0.0466	0.0822	34.54	0.8413	0.1591	0.8562	10.71
8.00	0.0681	0.0464	0.0824	34.26	0.8423	0.1581	0.8570	10.63
8.05	0.0685	0.0462	0.0826	33.99	0.8434	0.1571	0.8579	10.55
8.10	0.0688	0.0459	0.0828	33.73	0.8444	0.1561	0.8587	10.48
8.15	0.0692	0.0457	0.0829	33.46	0.8454	0.1552	0.8595	10.40
8.20	0.0695	0.0455	0.0831	33.20	0.8463	0.1542	0.8603	10.33
8.25	0.0699	0.0453	0.0833	32.95	0.8473	0.1533	0.8611	10.25
8.30	0.0702	0.0451	0.0835	32.70	0.8483	0.1523	0.8618	10.18
8.35	0.0706	0.0449	0.0836	32.45	0.8492	0.1514	0.8626	10.11
8.40	0.0709	0.0447	0.0838	32.21	0.8501	0.1505	0.8633	10.04
8.45	0.0713	0.0445	0.0840	31.96	0.8510	0.1496	0.8641	9.97
8.50	0.0716	0.0443	0.0842	31.73	0.8520	0.1487	0.8648	9.90
8.55	0.0719	0.0441	0.0843	31.49	0.8528	0.1479	0.8656	9.84
8.60	0.0722	0.0438	0.0845	31.26	0.8537	0.1470	0.8663	9.77
8.65	0.0725	0.0436	0.0847	31.04	0.8546	0.1461	0.8670	9.70
8.70	0.0729	0.0434	0.0848	30.81	0.8555	0.1453	0.8677	9.64
8.75	0.0732	0.0433	0.0850	30.59	0.8563	0.1445	0.8684	9.58
8.80	0.0735	0.0431	0.0852	30.37	0.8572	0.1436	0.8691	9.51
8.85	0.0738	0.0429	0.0853	30.16	0.8580	0.1428	0.8698	9.45
8.90	0.0741	0.0427	0.0855	29.95	0.8588	0.1420	0.8705	9.39
8.95	0.0744	0.0425	0.0856	29.74	0.8596	0.1412	0.8712	9.33
9.00	0.0747	0.0423	0.0858	29.53	0.8604	0.1404	0.8718	9.27
9.05	0.0749	0.0421	0.0860	29.33	0.8612	0.1396	0.8725	9.21
9.10	0.0752	0.0419	0.0861	29.12	0.8620	0.1389	0.8731	9.15
9.15	0.0755	0.0417	0.0863	28.93	0.8628	0.1381	0.8738	9.09
9.20	0.0758	0.0415	0.0864	28.73	0.8636	0.1373	0.8744	9.04
9.25	0.0761	0.0414	0.0866	28.54	0.8643	0.1366	0.8751	8.98
9.30	0.0763	0.0412	0.0867	28.35	0.8651	0.1359	0.8757	8.92
9.35	0.0766	0.0410	0.0869	28.16	0.8658	0.1351	0.8763	8.87
9.40	0.0769	0.0408	0.0870	27.97	0.8666	0.1344	0.8769	8.82
9.45	0.0771	0.0406	0.0872	27.79	0.8673	0.1337	0.8775	8.76
9.50	0.0774	0.0405	0.0873	27.61	0.8680	0.1330	0.8781	8.71
9.55	0.0776	0.0403	0.0875	27.43	0.8687	0.1323	0.8787	8.66
9.60	0.0779	0.0401	0.0876	27.25	0.8694	0.1316	0.8793	8.61
9.65	0.0781	0.0400	0.0878	27.08	0.8701	0.1309	0.8799	8.55
9.70	0.0784	0.0398	0.0879	26.90	0.8708	0.1302	0.8805	8.50
9.75	0.0786	0.0396	0.0881	26.73	0.8715	0.1295	0.8811	8.45
9.80	0.0789	0.0394	0.0882	26.57	0.8722	0.1289	0.8816	8.40
9.85	0.0791	0.0393	0.0883	26.40	0.8728	0.1282	0.8822	8.36
9.90	0.0794	0.0391	0.0885	26.24	0.8735	0.1276	0.8827	8.31
9.95	0.0796	0.0390	0.0886	26.07	0.8741	0.1269	0.8833	8.26
10.00	0.0798	0.0388	0.0888	25.91	0.8748	0.1263	0.8838	8.21

$k = 0.0$ $\sigma = 0.50$										
a	$\frac{1-\sigma^2}{2} \cdot x$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$\ell^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.0037	-5.9743	0.5322	5.3156	0.0049	1.0049	-0.0015	1.0049	359.92
1.05	1.0045	-5.4139	0.5542	5.2246	0.0054	1.0059	-0.0020	1.0059	359.89
1.10	1.0054	-4.9278	0.5757	5.1306	0.0059	1.0070	-0.0026	1.0070	359.85
1.15	1.0065	-4.5032	0.5965	5.0339	0.0065	1.0082	-0.0034	1.0082	359.81
1.20	1.0077	-4.1302	0.6167	4.9345	0.0072	1.0096	-0.0043	1.0096	359.76
1.25	1.0091	-3.8007	0.6362	4.8327	0.0080	1.0110	-0.0054	1.0111	359.69
1.30	1.0106	-3.5080	0.6550	4.7287	0.0088	1.0126	-0.0068	1.0126	359.62
1.35	1.0123	-3.2469	0.6732	4.6226	0.0098	1.0142	-0.0084	1.0143	359.53
1.40	1.0142	-3.0129	0.6906	4.5146	0.0109	1.0159	-0.0103	1.0160	359.42
1.45	1.0163	-2.8024	0.7074	4.4050	0.0122	1.0177	-0.0125	1.0178	359.30
1.50	1.0186	-2.6123	0.7234	4.2940	0.0137	1.0194	-0.0150	1.0195	359.16
1.55	1.0211	-2.4400	0.7386	4.1818	0.0153	1.0211	-0.0179	1.0213	359.00
1.60	1.0238	-2.2833	0.7531	4.0686	0.0171	1.0228	-0.0211	1.0230	358.82
1.65	1.0268	-2.1405	0.7669	3.9546	0.0192	1.0243	-0.0248	1.0246	358.61
1.70	1.0300	-2.0100	0.7799	3.8403	0.0215	1.0256	-0.0288	1.0260	358.39
1.75	1.0335	-1.8903	0.7921	3.7258	0.0241	1.0267	-0.0331	1.0272	358.15
1.80	1.0372	-1.7804	0.8035	3.6114	0.0270	1.0274	-0.0379	1.0281	357.89
1.85	1.0410	-1.6793	0.8142	3.4975	0.0303	1.0278	-0.0429	1.0287	357.61
1.90	1.0451	-1.5861	0.8241	3.3844	0.0339	1.0278	-0.0482	1.0289	357.32
1.95	1.0494	-1.5000	0.8333	3.2724	0.0379	1.0273	-0.0537	1.0287	357.01
2.00	1.0539	-1.4205	0.8418	3.1620	0.0423	1.0263	-0.0594	1.0281	356.69
2.05	1.0584	-1.3468	0.8495	3.0534	0.0472	1.0248	-0.0651	1.0269	356.36
2.10	1.0631	-1.2786	0.8566	2.9471	0.0525	1.0228	-0.0709	1.0252	356.04
2.15	1.0679	-1.2153	0.8630	2.8432	0.0582	1.0202	-0.0765	1.0230	355.71
2.20	1.0726	-1.1565	0.8687	2.7421	0.0644	1.0170	-0.0820	1.0203	355.39
2.25	1.0774	-1.1020	0.8739	2.6441	0.0711	1.0134	-0.0873	1.0172	355.08
2.30	1.0821	-1.0512	0.8786	2.5494	0.0781	1.0094	-0.0922	1.0136	354.78
2.35	1.0868	-1.0040	0.8828	2.4581	0.0856	1.0049	-0.0968	1.0096	354.50
2.40	1.0913	-0.9600	0.8865	2.3704	0.0934	1.0002	-0.1011	1.0053	354.23
2.45	1.0957	-0.9191	0.8898	2.2863	0.1016	0.9952	-0.1049	1.0007	353.98
2.50	1.0999	-0.8809	0.8928	2.2058	0.1102	0.9900	-0.1082	0.9959	353.76
2.55	1.1040	-0.8452	0.8954	2.1290	0.1190	0.9847	-0.1112	0.9909	353.56
2.60	1.1078	-0.8118	0.8978	2.0557	0.1280	0.9792	-0.1137	0.9858	353.38
2.65	1.1115	-0.7806	0.8999	1.9860	0.1372	0.9738	-0.1158	0.9807	353.22
2.70	1.1149	-0.7514	0.9018	1.9196	0.1467	0.9684	-0.1175	0.9755	353.08
2.75	1.1182	-0.7240	0.9035	1.8566	0.1562	0.9631	-0.1189	0.9704	352.96
2.80	1.1212	-0.6983	0.9050	1.7967	0.1659	0.9578	-0.1199	0.9653	352.86
2.85	1.1240	-0.6741	0.9064	1.7398	0.1756	0.9527	-0.1207	0.9603	352.78
2.90	1.1266	-0.6514	0.9076	1.6858	0.1853	0.9477	-0.1211	0.9554	352.72
2.95	1.1290	-0.6300	0.9087	1.6345	0.1951	0.9429	-0.1213	0.9507	352.67
3.00	1.1312	-0.6098	0.9098	1.5858	0.2048	0.9382	-0.1213	0.9460	352.63
3.05	1.1332	-0.5908	0.9107	1.5395	0.2145	0.9337	-0.1211	0.9415	352.61
3.10	1.1351	-0.5728	0.9116	1.4956	0.2241	0.9294	-0.1208	0.9372	352.60
3.15	1.1367	-0.5558	0.9125	1.4538	0.2337	0.9252	-0.1203	0.9330	352.59
3.20	1.1382	-0.5397	0.9133	1.4141	0.2431	0.9213	-0.1196	0.9290	352.60
3.25	1.1396	-0.5244	0.9140	1.3763	0.2525	0.9175	-0.1189	0.9251	352.62
3.30	1.1408	-0.5099	0.9147	1.3404	0.2618	0.9138	-0.1181	0.9214	352.64
3.35	1.1419	-0.4962	0.9154	1.3061	0.2709	0.9103	-0.1172	0.9178	352.66
3.40	1.1428	-0.4831	0.9160	1.2735	0.2798	0.9070	-0.1162	0.9144	352.70
3.45	1.1436	-0.4707	0.9166	1.2424	0.2887	0.9038	-0.1152	0.9111	352.73
3.50	1.1443	-0.4588	0.9172	1.2128	0.2974	0.9008	-0.1142	0.9080	352.77
3.55	1.1449	-0.4476	0.9178	1.1845	0.3059	0.8978	-0.1131	0.9049	352.82
3.60	1.1454	-0.4368	0.9184	1.1574	0.3143	0.8951	-0.1121	0.9020	352.86
3.65	1.1458	-0.4265	0.9189	1.1316	0.3225	0.8924	-0.1110	0.8993	352.91
3.70	1.1461	-0.4167	0.9195	1.1069	0.3306	0.8898	-0.1099	0.8966	352.96
3.75	1.1463	-0.4073	0.9200	1.0832	0.3385	0.8874	-0.1088	0.8940	353.01
3.80	1.1464	-0.3984	0.9206	1.0606	0.3463	0.8850	-0.1077	0.8916	353.06
3.85	1.1465	-0.3898	0.9211	1.0388	0.3539	0.8828	-0.1066	0.8892	353.12
3.90	1.1465	-0.3815	0.9216	1.0180	0.3613	0.8806	-0.1055	0.8869	353.17
3.95	1.1464	-0.3736	0.9221	0.9981	0.3686	0.8786	-0.1044	0.8847	353.22

$k = 0.0 \qquad \sigma = 0.50$

a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0049	0.0015	0.0051	163.27	0.0156	0.1236	0.1246	82.81
1.05	-0.0059	0.0020	0.0062	161.55	0.0189	0.1359	0.1372	82.07
1.10	-0.0070	0.0026	0.0075	159.75	0.0228	0.1487	0.1504	81.28
1.15	-0.0082	0.0034	0.0089	157.87	0.0272	0.1620	0.1642	80.46
1.20	-0.0096	0.0043	0.0105	155.89	0.0322	0.1757	0.1786	79.60
1.25	-0.0110	0.0054	0.0123	153.84	0.0379	0.1898	0.1935	78.71
1.30	-0.0126	0.0068	0.0143	151.70	0.0443	0.2042	0.2089	77.77
1.35	-0.0142	0.0084	0.0165	149.47	0.0514	0.2189	0.2249	76.79
1.40	-0.0159	0.0103	0.0190	147.16	0.0593	0.2339	0.2413	75.77
1.45	-0.0177	0.0125	0.0217	144.77	0.0681	0.2490	0.2582	74.71
1.50	-0.0194	0.0150	0.0246	142.30	0.0777	0.2642	0.2754	73.61
1.55	-0.0211	0.0179	0.0277	139.75	0.0883	0.2795	0.2931	72.46
1.60	-0.0228	0.0211	0.0311	137.13	0.0999	0.2946	0.3111	71.28
1.65	-0.0243	0.0248	0.0347	134.43	0.1124	0.3096	0.3294	70.05
1.70	-0.0256	0.0288	0.0385	131.66	0.1259	0.3243	0.3479	68.79
1.75	-0.0267	0.0331	0.0425	128.82	0.1403	0.3386	0.3665	67.49
1.80	-0.0274	0.0379	0.0467	125.93	0.1558	0.3524	0.3853	66.15
1.85	-0.0278	0.0429	0.0511	122.98	0.1722	0.3655	0.4040	64.78
1.90	-0.0278	0.0482	0.0556	119.99	0.1894	0.3779	0.4227	63.37
1.95	-0.0273	0.0537	0.0603	116.97	0.2075	0.3894	0.4412	61.95
2.00	-0.0263	0.0594	0.0650	113.92	0.2263	0.3999	0.4595	60.49
2.05	-0.0248	0.0651	0.0697	110.86	0.2457	0.4094	0.4775	59.03
2.10	-0.0228	0.0709	0.0744	107.80	0.2656	0.4177	0.4950	57.55
2.15	-0.0202	0.0765	0.0791	104.75	0.2859	0.4248	0.5120	56.06
2.20	-0.0170	0.0820	0.0838	101.73	0.3063	0.4306	0.5284	54.58
2.25	-0.0134	0.0873	0.0883	98.74	0.3268	0.4352	0.5443	53.10
2.30	-0.0094	0.0922	0.0927	95.81	0.3472	0.4386	0.5594	51.64
2.35	-0.0049	0.0968	0.0970	92.92	0.3674	0.4408	0.5738	50.19
2.40	-0.0002	0.1011	0.1011	90.11	0.3872	0.4419	0.5875	48.77
2.45	0.0048	0.1049	0.1050	87.37	0.4066	0.4419	0.6005	47.38
2.50	0.0100	0.1082	0.1087	84.71	0.4255	0.4409	0.6127	46.02
2.55	0.0153	0.1112	0.1122	82.14	0.4437	0.4391	0.6242	44.70
2.60	0.0208	0.1137	0.1156	79.66	0.4612	0.4365	0.6350	43.42
2.65	0.0262	0.1158	0.1187	77.26	0.4781	0.4332	0.6451	42.18
2.70	0.0316	0.1175	0.1217	74.96	0.4942	0.4293	0.6546	40.98
2.75	0.0369	0.1189	0.1245	72.75	0.5095	0.4249	0.6635	39.83
2.80	0.0422	0.1199	0.1271	70.63	0.5241	0.4201	0.6717	38.71
2.85	0.0473	0.1207	0.1296	68.60	0.5380	0.4150	0.6795	37.64
2.90	0.0523	0.1211	0.1319	66.65	0.5512	0.4096	0.6867	36.62
2.95	0.0571	0.1213	0.1341	64.79	0.5637	0.4040	0.6935	35.63
3.00	0.0618	0.1213	0.1361	63.01	0.5755	0.3983	0.6999	34.69
3.05	0.0663	0.1211	0.1381	61.31	0.5867	0.3924	0.7058	33.78
3.10	0.0706	0.1208	0.1399	59.69	0.5972	0.3865	0.7114	32.91
3.15	0.0748	0.1203	0.1416	58.13	0.6072	0.3806	0.7167	32.08
3.20	0.0787	0.1196	0.1432	56.65	0.6167	0.3747	0.7216	31.28
3.25	0.0825	0.1189	0.1447	55.23	0.6257	0.3688	0.7263	30.52
3.30	0.0862	0.1181	0.1462	53.87	0.6341	0.3630	0.7307	29.79
3.35	0.0897	0.1172	0.1476	52.58	0.6422	0.3573	0.7349	29.09
3.40	0.0930	0.1162	0.1489	51.33	0.6498	0.3516	0.7388	28.42
3.45	0.0962	0.1152	0.1501	50.15	0.6570	0.3461	0.7426	27.78
3.50	0.0992	0.1142	0.1513	49.01	0.6639	0.3406	0.7462	27.16
3.55	0.1022	0.1131	0.1524	47.92	0.6704	0.3353	0.7496	26.57
3.60	0.1049	0.1121	0.1535	46.88	0.6766	0.3301	0.7528	26.00
3.65	0.1076	0.1110	0.1546	45.88	0.6825	0.3250	0.7559	25.46
3.70	0.1102	0.1099	0.1556	44.92	0.6882	0.3200	0.7589	24.94
3.75	0.1126	0.1088	0.1566	44.00	0.6935	0.3152	0.7618	24.44
3.80	0.1150	0.1077	0.1575	43.12	0.6987	0.3105	0.7646	23.96
3.85	0.1172	0.1066	0.1584	42.27	0.7036	0.3059	0.7672	23.50
3.90	0.1194	0.1055	0.1593	41.46	0.7083	0.3015	0.7698	23.05
3.95	0.1214	0.1044	0.1601	40.68	0.7129	0.2971	0.7723	22.63

$k = 0.0$						$\sigma = 0.50$			
α	$\frac{1-\sigma^2}{2}\cdot X$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	1.1462	-0.3660	0.9226	0.9789	0.3757	0.8766	-0.1033	0.8826	353.28
4.05	1.1460	-0.3587	0.9231	0.9604	0.3827	0.8746	-0.1022	0.8806	353.33
4.10	1.1458	-0.3517	0.9236	0.9427	0.3896	0.8728	-0.1012	0.8786	353.39
4.15	1.1455	-0.3450	0.9242	0.9257	0.3963	0.8710	-0.1002	0.8767	353.44
4.20	1.1451	-0.3385	0.9247	0.9093	0.4028	0.8693	-0.0992	0.8749	353.49
4.25	1.1447	-0.3323	0.9252	0.8934	0.4092	0.8676	-0.0982	0.8732	353.54
4.30	1.1443	-0.3263	0.9256	0.8782	0.4155	0.8660	-0.0972	0.8714	353.60
4.35	1.1438	-0.3204	0.9261	0.8635	0.4217	0.8645	-0.0962	0.8698	353.65
4.40	1.1433	-0.3148	0.9266	0.8493	0.4277	0.8629	-0.0953	0.8682	353.70
4.45	1.1428	-0.3094	0.9271	0.8356	0.4336	0.8615	-0.0944	0.8666	353.75
4.50	1.1422	-0.3042	0.9276	0.8223	0.4394	0.8601	-0.0935	0.8651	353.80
4.55	1.1416	-0.2991	0.9281	0.8095	0.4451	0.8587	-0.0926	0.8637	353.85
4.60	1.1410	-0.2942	0.9286	0.7971	0.4506	0.8574	-0.0917	0.8622	353.89
4.65	1.1404	-0.2895	0.9291	0.7851	0.4561	0.8561	-0.0908	0.8609	353.94
4.70	1.1397	-0.2849	0.9296	0.7734	0.4614	0.8548	-0.0900	0.8595	353.99
4.75	1.1390	-0.2805	0.9301	0.7621	0.4667	0.8536	-0.0892	0.8582	354.04
4.80	1.1383	-0.2761	0.9305	0.7512	0.4718	0.8524	-0.0884	0.8569	354.08
4.85	1.1376	-0.2719	0.9310	0.7406	0.4768	0.8512	-0.0876	0.8557	354.13
4.90	1.1369	-0.2679	0.9315	0.7302	0.4818	0.8500	-0.0868	0.8545	354.17
4.95	1.1362	-0.2639	0.9320	0.7202	0.4866	0.8489	-0.0860	0.8533	354.21
5.00	1.1354	-0.2601	0.9325	0.7105	0.4914	0.8478	-0.0853	0.8521	354.26
5.05	1.1347	-0.2564	0.9329	0.7010	0.4961	0.8468	-0.0846	0.8510	354.30
5.10	1.1339	-0.2527	0.9334	0.6918	0.5007	0.8457	-0.0838	0.8499	354.34
5.15	1.1331	-0.2492	0.9339	0.6828	0.5052	0.8447	-0.0831	0.8488	354.38
5.20	1.1324	-0.2458	0.9343	0.6740	0.5096	0.8437	-0.0824	0.8478	354.42
5.25	1.1316	-0.2424	0.9348	0.6655	0.5140	0.8428	-0.0817	0.8467	354.46
5.30	1.1308	-0.2392	0.9352	0.6572	0.5183	0.8418	-0.0811	0.8457	354.50
5.35	1.1300	-0.2360	0.9357	0.6491	0.5225	0.8409	-0.0804	0.8447	354.54
5.40	1.1292	-0.2329	0.9361	0.6412	0.5267	0.8400	-0.0798	0.8438	354.58
5.45	1.1284	-0.2299	0.9366	0.6335	0.5307	0.8391	-0.0791	0.8428	354.61
5.50	1.1276	-0.2269	0.9370	0.6260	0.5348	0.8382	-0.0785	0.8419	354.65
5.55	1.1269	-0.2241	0.9375	0.6186	0.5387	0.8374	-0.0779	0.8410	354.69
5.60	1.1261	-0.2212	0.9379	0.6114	0.5426	0.8365	-0.0772	0.8401	354.72
5.65	1.1253	-0.2185	0.9383	0.6044	0.5464	0.8357	-0.0766	0.8392	354.76
5.70	1.1245	-0.2158	0.9387	0.5975	0.5502	0.8349	-0.0760	0.8383	354.80
5.75	1.1237	-0.2132	0.9392	0.5908	0.5539	0.8341	-0.0755	0.8375	354.83
5.80	1.1229	-0.2107	0.9396	0.5842	0.5575	0.8333	-0.0749	0.8367	354.86
5.85	1.1222	-0.2082	0.9400	0.5778	0.5611	0.8325	-0.0743	0.8358	354.90
5.90	1.1214	-0.2057	0.9404	0.5715	0.5647	0.8318	-0.0738	0.8350	354.93
5.95	1.1206	-0.2033	0.9408	0.5654	0.5682	0.8310	-0.0732	0.8343	354.97
6.00	1.1199	-0.2010	0.9412	0.5593	0.5716	0.8303	-0.0727	0.8335	355.00
6.05	1.1191	-0.1987	0.9416	0.5534	0.5750	0.8296	-0.0721	0.8327	355.03
6.10	1.1184	-0.1964	0.9420	0.5476	0.5783	0.8289	-0.0716	0.8320	355.06
6.15	1.1176	-0.1942	0.9424	0.5420	0.5816	0.8282	-0.0711	0.8313	355.09
6.20	1.1169	-0.1921	0.9428	0.5364	0.5848	0.8275	-0.0706	0.8306	355.13
6.25	1.1162	-0.1900	0.9431	0.5310	0.5880	0.8269	-0.0701	0.8298	355.16
6.30	1.1154	-0.1879	0.9435	0.5256	0.5912	0.8262	-0.0696	0.8292	355.19
6.35	1.1147	-0.1859	0.9439	0.5204	0.5943	0.8256	-0.0691	0.8285	355.22
6.40	1.1140	-0.1839	0.9443	0.5152	0.5974	0.8250	-0.0686	0.8278	355.25
6.45	1.1133	-0.1820	0.9446	0.5102	0.6004	0.8243	-0.0681	0.8272	355.28
6.50	1.1126	-0.1801	0.9450	0.5052	0.6034	0.8237	-0.0676	0.8265	355.31
6.55	1.1119	-0.1782	0.9453	0.5004	0.6063	0.8231	-0.0671	0.8259	355.34
6.60	1.1112	-0.1764	0.9457	0.4956	0.6092	0.8225	-0.0667	0.8252	355.36
6.65	1.1105	[illegible]	0.9460	0.4909	0.6121	0.8220	-0.0662	0.8246	355.39
6.70	1.1098	-0.1728	0.9464	0.4863	0.6149	0.8214	-0.0658	0.8240	355.42
6.75	1.1092	-0.1711	0.9467	0.4818	0.6177	0.8208	-0.0653	0.8234	355.45
6.80	1.1085	-0.1694	0.9471	0.4774	0.6204	0.8203	-0.0649	0.8228	355.48
6.85	1.1078	-0.1678	0.9474	0.4730	0.6231	0.8197	-0.0645	0.8223	355.50
6.90	1.1072	-0.1661	0.9477	0.4688	0.6258	0.8192	-0.0640	0.8217	355.53
6.95	1.1065	-0.1645	0.9480	0.4646	0.6284	0.8187	-0.0636	0.8211	355.56

$k = 0.0$				$\sigma = 0.50$				
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.1234	0.1033	0.1610	39.93	0.7172	0.2929	0.7747	22.22
4.05	0.1254	0.1022	0.1618	39.20	0.7214	0.2888	0.7771	21.82
4.10	0.1272	0.1012	0.1626	38.50	0.7254	0.2848	0.7793	21.44
4.15	0.1290	0.1002	0.1633	37.83	0.7293	0.2810	0.7815	21.07
4.20	0.1307	0.0992	0.1641	37.18	0.7330	0.2772	0.7837	20.72
4.25	0.1324	0.0982	0.1648	36.56	0.7366	0.2736	0.7858	20.37
4.30	0.1340	0.0972	0.1655	35.96	0.7401	0.2700	0.7879	20.04
4.35	0.1355	0.0962	0.1662	35.37	0.7435	0.2666	0.7899	19.72
4.40	0.1371	0.0953	0.1669	34.81	0.7468	0.2632	0.7918	19.41
4.45	0.1385	0.0944	0.1676	34.27	0.7500	0.2599	0.7937	19.12
4.50	0.1399	0.0935	0.1683	33.74	0.7531	0.2567	0.7956	18.83
4.55	0.1413	0.0926	0.1689	33.23	0.7561	0.2537	0.7975	18.55
4.60	0.1426	0.0917	0.1696	32.73	0.7590	0.2506	0.7993	18.27
4.65	0.1439	0.0908	0.1702	32.26	0.7618	0.2477	0.8011	18.01
4.70	0.1452	0.0900	0.1708	31.79	0.7646	0.2448	0.8028	17.76
4.75	0.1464	0.0892	0.1715	31.34	0.7673	0.2420	0.8045	17.51
4.80	0.1476	0.0884	0.1721	30.90	0.7699	0.2393	0.8062	17.27
4.85	0.1488	0.0876	0.1727	30.48	0.7724	0.2367	0.8079	17.03
4.90	0.1500	0.0868	0.1733	30.07	0.7749	0.2341	0.8095	16.81
4.95	0.1511	0.0860	0.1739	29.66	0.7774	0.2315	0.8111	16.59
5.00	0.1522	0.0853	0.1744	29.27	0.7798	0.2291	0.8127	16.37
5.05	0.1532	0.0846	0.1750	28.89	0.7821	0.2266	0.8143	16.16
5.10	0.1543	0.0838	0.1756	28.52	0.7844	0.2243	0.8158	15.96
5.15	0.1553	0.0831	0.1761	28.16	0.7866	0.2220	0.8173	15.76
5.20	0.1563	0.0824	0.1767	27.81	0.7888	0.2197	0.8188	15.57
5.25	0.1572	0.0817	0.1772	27.47	0.7909	0.2175	0.8203	15.38
5.30	0.1582	0.0811	0.1777	27.13	0.7930	0.2153	0.8218	15.19
5.35	0.1591	0.0804	0.1783	26.81	0.7951	0.2132	0.8232	15.01
5.40	0.1600	0.0798	0.1788	26.49	0.7971	0.2111	0.8246	14.84
5.45	0.1609	0.0791	0.1793	26.18	0.7991	0.2091	0.8260	14.67
5.50	0.1618	0.0785	0.1798	25.88	0.8010	0.2071	0.8274	14.50
5.55	0.1626	0.0779	0.1803	25.58	0.8029	0.2052	0.8287	14.33
5.60	0.1635	0.0772	0.1808	25.29	0.8048	0.2032	0.8300	14.17
5.65	0.1643	0.0766	0.1813	25.01	0.8066	0.2014	0.8313	14.02
5.70	0.1651	0.0760	0.1818	24.73	0.8084	0.1995	0.8326	13.86
5.75	0.1659	0.0755	0.1823	24.46	0.8102	0.1977	0.8339	13.71
5.80	0.1667	0.0749	0.1827	24.19	0.8119	0.1959	0.8352	13.57
5.85	0.1675	0.0743	0.1832	23.93	0.8136	0.1942	0.8364	13.42
5.90	0.1682	0.0738	0.1837	23.68	0.8152	0.1924	0.8377	13.28
5.95	0.1690	0.0732	0.1841	23.43	0.8169	0.1908	0.8389	13.14
6.00	0.1697	0.0727	0.1846	23.18	0.8185	0.1891	0.8401	13.01
6.05	0.1704	0.0721	0.1850	22.94	0.8201	0.1875	0.8412	12.88
6.10	0.1711	0.0716	0.1855	22.71	0.8216	0.1859	0.8424	12.75
6.15	0.1718	0.0711	0.1859	22.48	0.8232	0.1843	0.8435	12.62
6.20	0.1725	0.0706	0.1863	22.25	0.8247	0.1827	0.8447	12.49
6.25	0.1731	0.0701	0.1868	22.03	0.8261	0.1812	0.8458	12.37
6.30	0.1738	0.0696	0.1872	21.82	0.8276	0.1797	0.8469	12.25
6.35	0.1744	0.0691	0.1876	21.60	0.8290	0.1782	0.8480	12.13
6.40	0.1750	0.0686	0.1880	21.39	0.8304	0.1768	0.8490	12.02
6.45	0.1757	0.0681	0.1884	21.19	0.8318	0.1754	0.8501	11.90
6.50	0.1763	0.0676	0.1888	20.99	0.8332	0.1739	0.8511	11.79
6.55	0.1769	0.0671	0.1892	20.79	0.8345	0.1726	0.8522	11.68
6.60	0.1775	0.0667	0.1896	20.60	0.8358	0.1712	0.8532	11.58
6.65	0.1780	0.0662	0.1900	20.41	0.8371	0.1699	0.8542	11.47
6.70	0.1786	0.0658	0.1903	20.22	0.8384	0.1685	0.8552	11.37
6.75	0.1792	0.0653	0.1907	20.03	0.8396	0.1672	0.8561	11.26
6.80	0.1797	0.0649	0.1911	19.85	0.8409	0.1659	0.8571	11.16
6.85	0.1803	0.0645	0.1914	19.68	0.8421	0.1647	0.8580	11.07
6.90	0.1808	0.0640	0.1918	19.50	0.8433	0.1634	0.8590	10.97
6.95	0.1813	0.0636	0.1922	19.33	0.8445	0.1622	0.8599	10.87

a	$\frac{1-\sigma^2}{2}\cdot x$ REAL	$\frac{1-\sigma^2}{2}\cdot x$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
				$k = 0.0$ $\sigma = 0.50$					
7.00	1.1059	-0.1630	0.9484	0.4604	0.6310	0.8182	-0.0632	0.8206	355.58
7.05	1.1053	-0.1614	0.9487	0.4564	0.6336	0.8176	-0.0628	0.8200	355.61
7.10	1.1046	-0.1599	0.9490	0.4524	0.6361	0.8171	-0.0624	0.8195	355.64
7.15	1.1040	-0.1584	0.9493	0.4484	0.6386	0.8166	-0.0620	0.8190	355.66
7.20	1.1034	-0.1569	0.9496	0.4446	0.6411	0.8162	-0.0616	0.8185	355.69
7.25	1.1028	-0.1555	0.9499	0.4408	0.6435	0.8157	-0.0612	0.8180	355.71
7.30	1.1022	-0.1541	0.9502	0.4371	0.6459	0.8152	-0.0608	0.8175	355.74
7.35	1.1016	-0.1527	0.9505	0.4334	0.6483	0.8147	-0.0604	0.8170	355.76
7.40	1.1010	-0.1513	0.9508	0.4298	0.6507	0.8143	-0.0600	0.8165	355.78
7.45	1.1004	-0.1500	0.9511	0.4262	0.6530	0.8138	-0.0596	0.8160	355.81
7.50	1.0998	-0.1487	0.9514	0.4227	0.6553	0.8134	-0.0593	0.8155	355.83
7.55	1.0993	-0.1474	0.9517	0.4193	0.6575	0.8129	-0.0589	0.8151	355.86
7.60	1.0987	-0.1461	0.9519	0.4159	0.6597	0.8125	-0.0585	0.8146	355.88
7.65	1.0981	-0.1448	0.9522	0.4126	0.6620	0.8121	-0.0582	0.8141	355.90
7.70	1.0976	-0.1436	0.9525	0.4093	0.6641	0.8116	-0.0578	0.8137	355.92
7.75	1.0970	-0.1424	0.9528	0.4061	0.6663	0.8112	-0.0575	0.8133	355.95
7.80	1.0965	-0.1412	0.9530	0.4029	0.6684	0.8108	-0.0571	0.8128	355.97
7.85	1.0960	-0.1400	0.9533	0.3997	0.6705	0.8104	-0.0568	0.8124	355.99
7.90	1.0954	-0.1389	0.9535	0.3966	0.6726	0.8100	-0.0565	0.8120	356.01
7.95	1.0949	-0.1377	0.9538	0.3936	0.6746	0.8096	-0.0561	0.8116	356.03
8.00	1.0944	-0.1366	0.9541	0.3906	0.6766	0.8092	-0.0558	0.8112	356.06
8.05	1.0938	-0.1355	0.9543	0.3877	0.6786	0.8088	-0.0555	0.8107	356.08
8.10	1.0933	-0.1344	0.9546	0.3848	0.6806	0.8085	-0.0552	0.8103	356.10
8.15	1.0928	-0.1333	0.9548	0.3819	0.6826	0.8081	-0.0548	0.8100	356.12
8.20	1.0923	-0.1323	0.9551	0.3791	0.6845	0.8077	-0.0545	0.8096	356.14
8.25	1.0918	-0.1312	0.9553	0.3763	0.6864	0.8074	-0.0542	0.8092	356.16
8.30	1.0913	-0.1302	0.9555	0.3736	0.6883	0.8070	-0.0539	0.8088	356.18
8.35	1.0908	-0.1292	0.9558	0.3708	0.6901	0.8066	-0.0536	0.8084	356.20
8.40	1.0904	-0.1282	0.9560	0.3682	0.6920	0.8063	-0.0533	0.8081	356.22
8.45	1.0899	-0.1272	0.9563	0.3656	0.6938	0.8059	-0.0530	0.8077	356.24
8.50	1.0894	-0.1263	0.9565	0.3630	0.6956	0.8056	-0.0527	0.8073	356.26
8.55	1.0889	-0.1253	0.9567	0.3604	0.6974	0.8053	-0.0524	0.8070	356.28
8.60	1.0885	-0.1244	0.9569	0.3579	0.6991	0.8049	-0.0521	0.8066	356.30
8.65	1.0880	-0.1235	0.9572	0.3554	0.7009	0.8046	-0.0518	0.8063	356.31
8.70	1.0875	-0.1226	0.9574	0.3530	0.7026	0.8043	-0.0516	0.8059	356.33
8.75	1.0871	-0.1217	0.9576	0.3505	0.7043	0.8040	-0.0513	0.8056	356.35
8.80	1.0866	-0.1208	0.9578	0.3482	0.7060	0.8036	-0.0510	0.8053	356.37
8.85	1.0862	-0.1199	0.9580	0.3458	0.7077	0.8033	-0.0507	0.8049	356.39
8.90	1.0858	-0.1191	0.9583	0.3435	0.7093	0.8030	-0.0505	0.8046	356.41
8.95	1.0853	-0.1182	0.9585	0.3412	0.7109	0.8027	-0.0502	0.8043	356.42
9.00	1.0849	-0.1174	0.9587	0.3389	0.7125	0.8024	-0.0499	0.8040	356.44
9.05	1.0845	-0.1166	0.9589	0.3367	0.7141	0.8021	-0.0497	0.8036	356.46
9.10	1.0840	-0.1157	0.9591	0.3345	0.7157	0.8018	-0.0494	0.8033	356.47
9.15	1.0836	-0.1149	0.9593	0.3323	0.7173	0.8015	-0.0491	0.8030	356.49
9.20	1.0832	-0.1142	0.9595	0.3302	0.7188	0.8012	-0.0489	0.8027	356.51
9.25	1.0828	-0.1134	0.9597	0.3280	0.7203	0.8009	-0.0486	0.8024	356.53
9.30	1.0824	-0.1126	0.9599	0.3259	0.7218	0.8007	-0.0484	0.8021	356.54
9.35	1.0820	-0.1118	0.9601	0.3239	0.7233	0.8004	-0.0481	0.8018	356.56
9.40	1.0816	-0.1111	0.9603	0.3218	0.7248	0.8001	-0.0479	0.8015	356.57
9.45	1.0812	-0.1104	0.9605	0.3198	0.7263	0.7998	-0.0476	0.8013	356.59
9.50	1.0808	-0.1096	0.9607	0.3178	0.7277	0.7996	-0.0474	0.8010	356.61
9.55	1.0804	-0.1089	0.9609	0.3159	0.7292	0.7993	-0.0472	0.8007	356.62
9.60	1.0800	-0.1082	0.9610	0.3139	0.7306	0.7990	-0.0469	0.8004	356.64
9.65	1.0796	-0.1075	0.9612	0.3120	0.7320	0.7988	-0.0467	0.8001	356.65
9.70	1.0793	-0.1068	0.9614	0.3101	0.7334	0.7985	-0.0465	0.7999	356.67
9.75	1.0789	-0.1061	0.9616	0.3082	0.7348	0.7983	-0.0462	0.7996	356.68
9.80	1.0785	-0.1054	0.9618	0.3064	0.7361	0.7980	-0.0460	0.7993	356.70
9.85	1.0781	-0.1048	0.9620	0.3045	0.7375	0.7978	-0.0458	0.7991	356.71
9.90	1.0778	-0.1041	0.9621	0.3027	0.7388	0.7975	-0.0456	0.7988	356.73
9.95	1.0774	-0.1034	0.9623	0.3009	0.7401	0.7973	-0.0454	0.7985	356.74
10.00	1.0770	-0.1028	0.9625	0.2992	0.7414	0.7970	-0.0451	0.7983	356.76

$k = 0.0$ $\sigma = 0.50$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.1818	0.0632	0.1925	19.16	0.8456	0.1610	0.8608	10.78
7.05	0.1824	0.0628	0.1929	19.00	0.8468	0.1598	0.8617	10.69
7.10	0.1829	0.0624	0.1932	18.83	0.8479	0.1586	0.8626	10.60
7.15	0.1834	0.0620	0.1935	18.67	0.8490	0.1575	0.8635	10.51
7.20	0.1838	0.0616	0.1939	18.51	0.8501	0.1563	0.8643	10.42
7.25	0.1843	0.0612	0.1942	18.36	0.8512	0.1552	0.8652	10.33
7.30	0.1848	0.0608	0.1945	18.21	0.8522	0.1541	0.8660	10.25
7.35	0.1853	0.0604	0.1949	18.06	0.8533	0.1530	0.8669	10.17
7.40	0.1857	0.0600	0.1952	17.91	0.8543	0.1519	0.8677	10.08
7.45	0.1862	0.0596	0.1955	17.76	0.8553	0.1508	0.8685	10.00
7.50	0.1866	0.0593	0.1958	17.62	0.8563	0.1498	0.8693	9.92
7.55	0.1871	0.0589	0.1961	17.48	0.8573	0.1488	0.8701	9.84
7.60	0.1875	0.0585	0.1964	17.34	0.8583	0.1477	0.8709	9.77
7.65	0.1879	0.0582	0.1967	17.20	0.8592	0.1467	0.8717	9.69
7.70	0.1884	0.0578	0.1970	17.07	0.8602	0.1457	0.8724	9.62
7.75	0.1888	0.0575	0.1973	16.94	0.8611	0.1448	0.8732	9.54
7.80	0.1892	0.0571	0.1976	16.81	0.8620	0.1438	0.8739	9.47
7.85	0.1896	0.0568	0.1979	16.68	0.8629	0.1428	0.8747	9.40
7.90	0.1900	0.0565	0.1982	16.55	0.8638	0.1419	0.8754	9.33
7.95	0.1904	0.0561	0.1985	16.43	0.8647	0.1410	0.8761	9.26
8.00	0.1908	0.0558	0.1988	16.30	0.8656	0.1400	0.8768	9.19
8.05	0.1912	0.0555	0.1990	16.18	0.8664	0.1391	0.8775	9.12
8.10	0.1915	0.0552	0.1993	16.06	0.8673	0.1382	0.8782	9.06
8.15	0.1919	0.0548	0.1996	15.95	0.8681	0.1373	0.8789	8.99
8.20	0.1923	0.0545	0.1999	15.83	0.8690	0.1365	0.8796	8.93
8.25	0.1926	0.0542	0.2001	15.72	0.8698	0.1356	0.8803	8.86
8.30	0.1930	0.0539	0.2004	15.60	0.8706	0.1348	0.8810	8.80
8.35	0.1934	0.0536	0.2006	15.49	0.8714	0.1339	0.8816	8.74
8.40	0.1937	0.0533	0.2009	15.38	0.8722	0.1331	0.8823	8.68
8.45	0.1941	0.0530	0.2012	15.27	0.8729	0.1323	0.8829	8.62
8.50	0.1944	0.0527	0.2014	15.17	0.8737	0.1314	0.8835	8.56
8.55	0.1947	0.0524	0.2017	15.06	0.8745	0.1306	0.8842	8.50
8.60	0.1951	0.0521	0.2019	14.96	0.8752	0.1299	0.8848	8.44
8.65	0.1954	0.0518	0.2022	14.86	0.8760	0.1291	0.8854	8.38
8.70	0.1957	0.0516	0.2024	14.76	0.8767	0.1283	0.8860	8.33
8.75	0.1960	0.0513	0.2026	14.66	0.8774	0.1275	0.8866	8.27
8.80	0.1964	0.0510	0.2029	14.56	0.8781	0.1268	0.8872	8.22
8.85	0.1967	0.0507	0.2031	14.46	0.8788	0.1260	0.8878	8.16
8.90	0.1970	0.0505	0.2033	14.37	0.8795	0.1253	0.8884	8.11
8.95	0.1973	0.0502	0.2036	14.27	0.8802	0.1246	0.8890	8.06
9.00	0.1976	0.0499	0.2038	14.18	0.8809	0.1238	0.8896	8.00
9.05	0.1979	0.0497	0.2040	14.09	0.8816	0.1231	0.8901	7.95
9.10	0.1982	0.0494	0.2042	14.00	0.8822	0.1224	0.8907	7.90
9.15	0.1985	0.0491	0.2045	13.91	0.8829	0.1217	0.8913	7.85
9.20	0.1988	0.0489	0.2047	13.82	0.8835	0.1210	0.8918	7.80
9.25	0.1991	0.0486	0.2049	13.73	0.8842	0.1204	0.8923	7.75
9.30	0.1993	0.0484	0.2051	13.64	0.8848	0.1197	0.8929	7.70
9.35	0.1996	0.0481	0.2053	13.56	0.8855	0.1190	0.8934	7.66
9.40	0.1999	0.0479	0.2055	13.47	0.8861	0.1184	0.8940	7.61
9.45	0.2002	0.0476	0.2058	13.39	0.8867	0.1177	0.8945	7.56
9.50	0.2004	0.0474	0.2060	13.31	0.8873	0.1171	0.8950	7.52
9.55	0.2007	0.0472	0.2062	13.23	0.8879	0.1164	0.8955	7.47
9.60	0.2010	0.0469	0.2064	13.15	0.8885	0.1158	0.8960	7.43
9.65	0.2012	0.0467	0.2066	13.07	0.8891	0.1152	0.8965	7.38
9.70	0.2015	0.0465	0.2068	12.99	0.8897	0.1146	0.8970	7.34
9.75	0.2017	0.0462	0.2070	12.91	0.8903	0.1140	0.8975	7.29
9.80	0.2020	0.0460	0.2072	12.83	0.8908	0.1134	0.8980	7.25
9.85	0.2022	0.0458	0.2074	12.76	0.8914	0.1128	0.8985	7.21
9.90	0.2025	0.0456	0.2076	12.68	0.8919	0.1122	0.8990	7.17
9.95	0.2027	0.0454	0.2078	12.61	0.8925	0.1116	0.8994	7.13
10.00	0.2030	0.0451	0.2079	12.54	0.8930	0.1110	0.8999	7.09

$k = 0.1$ $\sigma = 0.00$									
a	$\frac{1-\sigma^2}{2}\cdot X$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.2278	-9.9944	0.4208	5.5585	0.0039	1.0053	0.0241	1.0056	1.37
1.05	1.2280	-9.0641	0.4391	5.4893	0.0041	1.0064	0.0263	1.0068	1.50
1.10	1.2283	-8.2577	0.4570	5.4177	0.0044	1.0077	0.0286	1.0081	1.63
1.15	1.2286	-7.5541	0.4745	5.3438	0.0048	1.0091	0.0310	1.0096	1.76
1.20	1.2290	-6.9365	0.4917	5.2678	0.0052	1.0107	0.0333	1.0113	1.89
1.25	1.2294	-6.3915	0.5084	5.1898	0.0056	1.0125	0.0357	1.0131	2.02
1.30	1.2298	-5.9080	0.5247	5.1099	0.0060	1.0145	0.0380	1.0152	2.15
1.35	1.2303	-5.4772	0.5406	5.0284	0.0065	1.0166	0.0403	1.0174	2.27
1.40	1.2309	-5.0917	0.5560	4.9452	0.0071	1.0190	0.0425	1.0199	2.39
1.45	1.2315	-4.7452	0.5710	4.8607	0.0077	1.0215	0.0446	1.0225	2.50
1.50	1.2322	-4.4328	0.5856	4.7749	0.0084	1.0243	0.0466	1.0253	2.61
1.55	1.2329	-4.1501	0.5996	4.6880	0.0092	1.0272	0.0485	1.0283	2.71
1.60	1.2337	-3.8935	0.6133	4.6002	0.0100	1.0303	0.0503	1.0315	2.79
1.65	1.2345	-3.6598	0.6264	4.5116	0.0110	1.0335	0.0518	1.0348	2.87
1.70	1.2354	-3.4464	0.6391	4.4223	0.0120	1.0369	0.0531	1.0383	2.93
1.75	1.2364	-3.2510	0.6513	4.3326	0.0131	1.0405	0.0543	1.0419	2.99
1.80	1.2375	-3.0717	0.6631	4.2426	0.0144	1.0441	0.0551	1.0456	3.02
1.85	1.2386	-2.9067	0.6743	4.1525	0.0157	1.0478	0.0558	1.0493	3.05
1.90	1.2398	-2.7546	0.6851	4.0624	0.0172	1.0516	0.0561	1.0531	3.05
1.95	1.2410	-2.6141	0.6955	3.9724	0.0188	1.0555	0.0562	1.0570	3.05
2.00	1.2423	-2.4841	0.7054	3.8828	0.0206	1.0593	0.0560	1.0608	3.03
2.05	1.2437	-2.3635	0.7148	3.7938	0.0225	1.0631	0.0555	1.0645	2.99
2.10	1.2451	-2.2515	0.7238	3.7053	0.0246	1.0668	0.0547	1.0682	2.94
2.15	1.2465	-2.1473	0.7323	3.6177	0.0268	1.0704	0.0536	1.0718	2.87
2.20	1.2480	-2.0503	0.7404	3.5311	0.0293	1.0740	0.0523	1.0752	2.79
2.25	1.2495	-1.9597	0.7481	3.4455	0.0319	1.0773	0.0507	1.0785	2.70
2.30	1.2510	-1.8751	0.7554	3.3612	0.0347	1.0805	0.0489	1.0816	2.59
2.35	1.2526	-1.7960	0.7622	3.2783	0.0377	1.0835	0.0469	1.0846	2.48
2.40	1.2542	-1.7219	0.7687	3.1968	0.0409	1.0863	0.0447	1.0873	2.36
2.45	1.2557	-1.6525	0.7748	3.1169	0.0443	1.0889	0.0423	1.0897	2.23
2.50	1.2573	-1.5873	0.7806	3.0387	0.0479	1.0912	0.0398	1.0920	2.09
2.55	1.2588	-1.5261	0.7860	2.9622	0.0517	1.0933	0.0372	1.0940	1.95
2.60	1.2603	-1.4686	0.7911	2.8876	0.0557	1.0952	0.0345	1.0957	1.80
2.65	1.2618	-1.4145	0.7959	2.8149	0.0599	1.0968	0.0318	1.0972	1.66
2.70	1.2632	-1.3635	0.8004	2.7442	0.0643	1.0982	0.0290	1.0985	1.51
2.75	1.2645	-1.3154	0.8046	2.6755	0.0689	1.0993	0.0262	1.0996	1.37
2.80	1.2658	-1.2701	0.8086	2.6088	0.0736	1.1002	0.0234	1.1004	1.22
2.85	1.2671	-1.2273	0.8123	2.5441	0.0785	1.1009	0.0207	1.1011	1.08
2.90	1.2682	-1.1869	0.8158	2.4815	0.0836	1.1014	0.0180	1.1015	0.94
2.95	1.2693	-1.1486	0.8191	2.4209	0.0888	1.1017	0.0154	1.1018	0.80
3.00	1.2703	-1.1125	0.8222	2.3624	0.0942	1.1018	0.0129	1.1019	0.67
3.05	1.2712	-1.0782	0.8251	2.3059	0.0997	1.1018	0.0105	1.1019	0.54
3.10	1.2720	-1.0458	0.8278	2.2513	0.1053	1.1017	0.0081	1.1017	0.42
3.15	1.2727	-1.0150	0.8304	2.1987	0.1109	1.1014	0.0059	1.1014	0.30
3.20	1.2733	-0.9858	0.8328	2.1480	0.1167	1.1010	0.0037	1.1010	0.19
3.25	1.2738	-0.9581	0.8351	2.0992	0.1226	1.1005	0.0017	1.1005	0.09
3.30	1.2742	-0.9317	0.8373	2.0521	0.1285	1.1000	-0.0003	1.1000	359.99
3.35	1.2745	-0.9066	0.8394	2.0069	0.1344	1.0994	-0.0021	1.0994	359.89
3.40	1.2747	-0.8828	0.8414	1.9633	0.1404	1.0987	-0.0038	1.0987	359.80
3.45	1.2748	-0.8601	0.8433	1.9213	0.1464	1.0979	-0.0055	1.0979	359.71
3.50	1.2748	-0.8384	0.8451	1.8810	0.1524	1.0971	-0.0070	1.0972	359.63
3.55	1.2747	-0.8177	0.8468	1.8421	0.1585	1.0963	-0.0085	1.0964	359.56
3.60	1.2746	-0.7980	0.8484	1.8047	0.1645	1.0955	-0.0098	1.0955	359.49
3.65	1.2743	-0.7792	0.8500	1.7688	0.1705	1.0946	-0.0111	1.0947	359.42
3.70	1.2739	-0.7612	0.8516	1.7341	0.1766	1.0938	-0.0123	1.0938	359.36
3.75	1.2735	-0.7440	0.8530	1.7008	0.1825	1.0929	-0.0134	1.0929	359.30
3.80	1.2730	-0.7275	0.8545	1.6687	0.1885	1.0920	-0.0145	1.0921	359.24
3.85	1.2724	-0.7117	0.8559	1.6378	0.1944	1.0911	-0.0154	1.0912	359.19
3.90	1.2717	-0.6966	0.8572	1.6080	0.2003	1.0902	-0.0164	1.0903	359.14
3.95	1.2710	-0.6821	0.8585	1.5793	0.2061	1.0893	-0.0172	1.0894	359.09

$k = 0.1$ $\sigma = 0.00$

a	$1+\eta$ REAL	$1+\eta$ IMAG.	$1+\eta$ MODULUS	$1+\eta$ PHASE (DEGREES)	$1+\eta F_{10}$ REAL	$1+\eta F_{10}$ IMAG.	$1+\eta F_{10}$ MODULUS	$1+\eta F_{10}$ PHASE (DEGREES)
1.00	-0.0053	-0.0241	0.0247	257.58	0.0121	0.0986	0.0993	83.00
1.05	-0.0064	-0.0263	0.0271	256.32	0.0147	0.1083	0.1093	82.28
1.10	-0.0077	-0.0286	0.0297	255.00	0.0176	0.1185	0.1198	81.54
1.15	-0.0091	-0.0310	0.0323	253.63	0.0210	0.1290	0.1307	80.76
1.20	-0.0107	-0.0333	0.0350	252.20	0.0248	0.1398	0.1420	79.95
1.25	-0.0125	-0.0357	0.0378	250.71	0.0290	0.1509	0.1536	79.11
1.30	-0.0145	-0.0380	0.0407	249.18	0.0338	0.1622	0.1657	78.24
1.35	-0.0166	-0.0403	0.0436	247.59	0.0390	0.1738	0.1781	77.34
1.40	-0.0190	-0.0425	0.0465	245.95	0.0449	0.1856	0.1909	76.41
1.45	-0.0215	-0.0446	0.0495	244.26	0.0512	0.1974	0.2040	75.45
1.50	-0.0243	-0.0466	0.0526	242.53	0.0582	0.2094	0.2173	74.47
1.55	-0.0272	-0.0485	0.0556	240.76	0.0658	0.2214	0.2310	73.45
1.60	-0.0303	-0.0503	0.0587	238.94	0.0740	0.2334	0.2448	72.42
1.65	-0.0335	-0.0518	0.0617	237.09	0.0828	0.2453	0.2589	71.36
1.70	-0.0369	-0.0531	0.0647	235.20	0.0922	0.2571	0.2731	70.28
1.75	-0.0405	-0.0543	0.0677	233.29	0.1022	0.2687	0.2875	69.18
1.80	-0.0441	-0.0551	0.0706	231.34	0.1128	0.2801	0.3020	68.06
1.85	-0.0478	-0.0558	0.0735	229.37	0.1241	0.2912	0.3165	66.92
1.90	-0.0516	-0.0561	0.0763	227.38	0.1359	0.3019	0.3310	65.77
1.95	-0.0555	-0.0562	0.0790	225.38	0.1482	0.3122	0.3456	64.60
2.00	-0.0593	-0.0560	0.0815	223.36	0.1610	0.3220	0.3600	63.43
2.05	-0.0631	-0.0555	0.0840	221.34	0.1744	0.3314	0.3744	62.25
2.10	-0.0668	-0.0547	0.0863	219.31	0.1881	0.3401	0.3887	61.06
2.15	-0.0704	-0.0536	0.0885	217.29	0.2022	0.3483	0.4028	59.87
2.20	-0.0740	-0.0523	0.0906	215.27	0.2166	0.3559	0.4166	58.67
2.25	-0.0773	-0.0507	0.0925	213.26	0.2313	0.3628	0.4303	57.48
2.30	-0.0805	-0.0489	0.0942	211.27	0.2462	0.3690	0.4436	56.29
2.35	-0.0835	-0.0469	0.0958	209.31	0.2613	0.3746	0.4567	55.11
2.40	-0.0863	-0.0447	0.0972	207.36	0.2764	0.3795	0.4694	53.93
2.45	-0.0889	-0.0423	0.0985	205.45	0.2915	0.3836	0.4818	52.77
2.50	-0.0912	-0.0398	0.0996	203.57	0.3066	0.3871	0.4938	51.62
2.55	-0.0933	-0.0372	0.1005	201.73	0.3216	0.3900	0.5055	50.48
2.60	-0.0952	-0.0345	0.1012	199.92	0.3365	0.3921	0.5167	49.37
2.65	-0.0968	-0.0318	0.1019	198.16	0.3512	0.3937	0.5276	48.27
2.70	-0.0982	-0.0290	0.1023	196.45	0.3656	0.3947	0.5380	47.19
2.75	-0.0993	-0.0262	0.1027	194.78	0.3798	0.3951	0.5481	46.13
2.80	-0.1002	-0.0234	0.1029	193.17	0.3937	0.3950	0.5577	45.10
2.85	-0.1009	-0.0207	0.1030	191.60	0.4072	0.3944	0.5669	44.09
2.90	-0.1014	-0.0180	0.1030	190.09	0.4204	0.3934	0.5757	43.10
2.95	-0.1017	-0.0154	0.1029	188.63	0.4331	0.3920	0.5842	42.14
3.00	-0.1018	-0.0129	0.1026	187.22	0.4455	0.3902	0.5922	41.21
3.05	-0.1018	-0.0105	0.1024	185.86	0.4575	0.3881	0.5999	40.31
3.10	-0.1017	-0.0081	0.1020	184.56	0.4691	0.3857	0.6073	39.43
3.15	-0.1014	-0.0059	0.1016	183.31	0.4803	0.3830	0.6143	38.57
3.20	-0.1010	-0.0037	0.1011	182.11	0.4910	0.3802	0.6210	37.75
3.25	-0.1005	-0.0017	0.1006	180.95	0.5014	0.3771	0.6274	36.95
3.30	-0.1000	0.0003	0.1000	179.85	0.5114	0.3739	0.6335	36.17
3.35	-0.0994	0.0021	0.0994	178.79	0.5210	0.3706	0.6394	35.43
3.40	-0.0987	0.0038	0.0987	177.77	0.5302	0.3672	0.6449	34.70
3.45	-0.0979	0.0055	0.0981	176.80	0.5391	0.3637	0.6503	34.01
3.50	-0.0971	0.0070	0.0974	175.87	0.5476	0.3601	0.6554	33.33
3.55	-0.0963	0.0085	0.0967	174.98	0.5558	0.3565	0.6603	32.68
3.60	-0.0955	0.0098	0.0960	174.13	0.5636	0.3529	0.6650	32.05
3.65	-0.0946	0.0111	0.0953	173.31	0.5712	0.3493	0.6695	31.44
3.70	-0.0938	0.0123	0.0946	172.53	0.5784	0.3456	0.6738	30.86
3.75	-0.0929	0.0134	0.0938	171.78	0.5854	0.3420	0.6780	30.29
3.80	-0.0920	0.0145	0.0931	171.06	0.5922	0.3384	0.6820	29.75
3.85	-0.0911	0.0154	0.0924	170.37	0.5986	0.3348	0.6859	29.22
3.90	-0.0902	0.0164	0.0917	169.71	0.6049	0.3313	0.6896	28.71
3.95	-0.0893	0.0172	0.0909	169.08	0.6109	0.3278	0.6933	28.22

$k = 0.1$ $\sigma = 0.00$									
a	$\frac{1-\sigma^2}{2}\cdot X$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	1.2702	-0.6681	0.8598	1.5517	0.2119	1.0884	-0.0180	1.0886	359.05
4.05	1.2693	-0.6547	0.8610	1.5250	0.2176	1.0875	-0.0188	1.0877	359.01
4.10	1.2684	-0.6419	0.8623	1.4992	0.2233	1.0867	-0.0195	1.0869	358.97
4.15	1.2674	-0.6295	0.8635	1.4744	0.2289	1.0858	-0.0202	1.0860	358.94
4.20	1.2664	-0.6176	0.8646	1.4504	0.2345	1.0850	-0.0208	1.0852	358.90
4.25	1.2653	-0.6061	0.8658	1.4272	0.2400	1.0841	-0.0214	1.0843	358.87
4.30	1.2642	-0.5950	0.8669	1.4048	0.2454	1.0833	-0.0219	1.0835	358.84
4.35	1.2630	-0.5843	0.8680	1.3831	0.2508	1.0825	-0.0224	1.0827	358.81
4.40	1.2618	-0.5740	0.8691	1.3621	0.2561	1.0817	-0.0229	1.0819	358.79
4.45	1.2605	-0.5641	0.8701	1.3418	0.2614	1.0809	-0.0234	1.0812	358.76
4.50	1.2592	-0.5545	0.8712	1.3221	0.2666	1.0801	-0.0238	1.0804	358.74
4.55	1.2579	-0.5452	0.8722	1.3030	0.2717	1.0794	-0.0242	1.0797	358.72
4.60	1.2566	-0.5362	0.8732	1.2845	0.2768	1.0786	-0.0246	1.0789	358.69
4.65	1.2552	-0.5275	0.8743	1.2666	0.2818	1.0779	-0.0249	1.0782	358.67
4.70	1.2538	-0.5191	0.8752	1.2492	0.2867	1.0772	-0.0253	1.0775	358.66
4.75	1.2524	-0.5109	0.8762	1.2323	0.2916	1.0765	-0.0256	1.0768	358.64
4.80	1.2509	-0.5030	0.8772	1.2159	0.2965	1.0758	-0.0259	1.0761	358.62
4.85	1.2495	-0.4953	0.8782	1.1999	0.3012	1.0751	-0.0261	1.0754	358.61
4.90	1.2480	-0.4878	0.8791	1.1844	0.3059	1.0744	-0.0264	1.0747	358.59
4.95	1.2465	-0.4806	0.8800	1.1693	0.3106	1.0737	-0.0267	1.0740	358.58
5.00	1.2450	-0.4735	0.8810	1.1546	0.3152	1.0731	-0.0269	1.0734	358.56
5.05	1.2435	-0.4667	0.8819	1.1402	0.3197	1.0724	-0.0271	1.0728	358.55
5.10	1.2420	-0.4600	0.8828	1.1263	0.3242	1.0718	-0.0273	1.0721	358.54
5.15	1.2405	-0.4536	0.8837	1.1126	0.3287	1.0711	-0.0275	1.0715	358.53
5.20	1.2390	-0.4473	0.8845	1.0994	0.3331	1.0705	-0.0277	1.0709	358.52
5.25	1.2375	-0.4411	0.8854	1.0864	0.3374	1.0699	-0.0278	1.0703	358.51
5.30	1.2360	-0.4352	0.8863	1.0738	0.3417	1.0693	-0.0280	1.0697	358.50
5.35	1.2344	-0.4293	0.8871	1.0614	0.3460	1.0687	-0.0281	1.0691	358.49
5.40	1.2329	-0.4237	0.8879	1.0494	0.3502	1.0682	-0.0283	1.0685	358.48
5.45	1.2314	-0.4181	0.8888	1.0376	0.3543	1.0676	-0.0284	1.0680	358.48
5.50	1.2299	-0.4127	0.8896	1.0261	0.3584	1.0670	-0.0285	1.0674	358.47
5.55	1.2284	-0.4074	0.8904	1.0148	0.3625	1.0665	-0.0286	1.0668	358.46
5.60	1.2269	-0.4023	0.8912	1.0038	0.3665	1.0659	-0.0287	1.0663	358.46
5.65	1.2254	-0.3973	0.8920	0.9930	0.3705	1.0654	-0.0288	1.0658	358.45
5.70	1.2240	-0.3924	0.8928	0.9824	0.3744	1.0648	-0.0289	1.0652	358.45
5.75	1.2225	-0.3876	0.8935	0.9721	0.3783	1.0643	-0.0290	1.0647	358.44
5.80	1.2210	-0.3829	0.8943	0.9620	0.3821	1.0638	-0.0291	1.0642	358.44
5.85	1.2196	-0.3783	0.8951	0.9521	0.3859	1.0633	-0.0291	1.0637	358.43
5.90	1.2181	-0.3738	0.8958	0.9424	0.3897	1.0628	-0.0292	1.0632	358.43
5.95	1.2167	-0.3694	0.8965	0.9328	0.3934	1.0623	-0.0292	1.0627	358.42
6.00	1.2153	-0.3651	0.8973	0.9235	0.3971	1.0618	-0.0293	1.0622	358.42
6.05	1.2139	-0.3609	0.8980	0.9143	0.4008	1.0613	-0.0293	1.0617	358.42
6.10	1.2125	-0.3568	0.8987	0.9054	0.4044	1.0608	-0.0294	1.0612	358.41
6.15	1.2111	-0.3528	0.8994	0.8966	0.4080	1.0604	-0.0294	1.0608	358.41
6.20	1.2097	-0.3489	0.9001	0.8879	0.4115	1.0599	-0.0294	1.0603	358.41
6.25	1.2084	-0.3450	0.9007	0.8794	0.4150	1.0594	-0.0294	1.0599	358.41
6.30	1.2070	-0.3412	0.9014	0.8711	0.4185	1.0590	-0.0295	1.0594	358.41
6.35	1.2057	-0.3375	0.9021	0.8629	0.4219	1.0586	-0.0295	1.0590	358.40
6.40	1.2044	-0.3339	0.9027	0.8549	0.4253	1.0581	-0.0295	1.0585	358.40
6.45	1.2031	-0.3304	0.9034	0.8470	0.4287	1.0577	-0.0295	1.0581	358.40.
6.50	1.2018	-0.3269	0.9040	0.8393	0.4320	1.0573	-0.0295	1.0577	358.40
6.55	1.2005	-0.3235	0.9047	0.8317	0.4353	1.0568	-0.0295	1.0572	358.40
6.60	1.1992	-0.3201	0.9053	0.8242	0.4386	1.0564	-0.0295	1.0568	358.40
6.65	1.1979	-0.3168	0.9059	0.8169	0.4418	1.0560	-0.0295	1.0564	358.40
6.70	1.1967	-0.3136	0.9065	0.8096	0.4450	1.0556	-0.0295	1.0560	358.40
6.75	1.1955	-0.3105	0.9071	0.8025	0.4482	1.0552	-0.0295	1.0556	358.40
6.80	1.1942	-0.3074	0.9077	0.7956	0.4513	1.0548	-0.0294	1.0552	358.40
6.85	1.1930	-0.3043	0.9083	0.7887	0.4544	1.0544	-0.0294	1.0548	358.40
6.90	1.1918	-0.3013	0.9089	0.7820	0.4575	1.0540	-0.0294	1.0544	358.40
6.95	1.1907	-0.2984	0.9094	0.7753	0.4606	1.0537	-0.0294	1.0541	358.40

	$k = 0.1$			$\sigma = 0.00$				
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	-0.0884	0.0180	0.0902	168.47	0.6167	0.3244	0.6968	27.74
4.05	-0.0875	0.0188	0.0895	167.88	0.6223	0.3210	0.7002	27.28
4.10	-0.0867	0.0195	0.0888	167.32	0.6277	0.3176	0.7034	26.84
4.15	-0.0858	0.0202	0.0882	166.77	0.6329	0.3143	0.7066	26.41
4.20	-0.0850	0.0208	0.0875	166.25	0.6379	0.3111	0.7097	26.00
..25	-0.0841	0.0214	0.0868	165.74	0.6428	0.3079	0.7128	25.59
4.30	-0.0833	0.0219	0.0862	165.25	0.6476	0.3048	0.7157	25.21
4.35	-0.0825	0.0224	0.0855	164.78	0.6522	0.3017	0.7186	24.83
4.40	-0.0817	0.0229	0.0849	164.33	0.6566	0.2987	0.7214	24.46
4.45	-0.0809	0.0234	0.0842	163.88	0.6610	0.2958	0.7241	24.11
4.50	-0.0801	0.0238	0.0836	163.46	0.6652	0.2929	0.7268	23.77
4.55	-0.0794	0.0242	0.0830	163.04	0.6693	0.2901	0.7294	23.43
4.60	-0.0786	0.0246	0.0824	162.64	0.6732	0.2873	0.7320	23.11
4.65	-0.0779	0.0249	0.0818	162.25	0.6771	0.2846	0.7345	22.79
4.70	-0.0772	0.0253	0.0812	161.87	0.6809	0.2819	0.7369	22.49
4.75	-0.0765	0.0256	0.0806	161.50	0.6846	0.2793	0.7393	22.19
4.80	-0.0758	0.0259	0.0801	161.14	0.6882	0.2767	0.7417	21.90
4.85	-0.0751	0.0261	0.0795	160.79	0.6917	0.2742	0.7440	21.62
4.90	-0.0744	0.0264	0.0789	160.45	0.6951	0.2717	0.7463	21.35
4.95	-0.0737	0.0267	0.0784	160.12	0.6984	0.2693	0.7485	21.08
5.00	-0.0731	0.0269	0.0778	159.80	0.7017	0.2669	0.7507	20.82
5.05	-0.0724	0.0271	0.0773	159.48	0.7049	0.2645	0.7529	20.57
5.10	-0.0718	0.0273	0.0768	159.18	0.7080	0.2622	0.7550	20.32
5.15	-0.0711	0.0275	0.0763	158.88	0.7111	0.2600	0.7571	20.08
5.20	-0.0705	0.0277	0.0758	158.58	0.7141	0.2578	0.7592	19.85
5.25	-0.0699	0.0278	0.0753	158.29	0.7170	0.2556	0.7612	19.62
5.30	-0.0693	0.0280	0.0748	158.01	0.7199	0.2534	0.7632	19.40
5.35	-0.0687	0.0281	0.0743	157.74	0.7227	0.2513	0.7651	19.18
5.40	-0.0682	0.0283	0.0738	157.47	0.7254	0.2493	0.7671	18.96
5.45	-0.0676	0.0284	0.0733	157.21	0.7281	0.2472	0.7690	18.75
5.50	-0.0670	0.0285	0.0728	156.95	0.7308	0.2452	0.7708	18.55
5.55	-0.0665	0.0286	0.0724	156.70	0.7334	0.2432	0.7727	18.35
5.60	-0.0659	0.0287	0.0719	156.45	0.7359	0.2413	0.7745	18.15
5.65	-0.0654	0.0288	0.0714	156.21	0.7384	0.2394	0.7763	17.96
5.70	-0.0648	0.0289	0.0710	155.97	0.7409	0.2375	0.7780	17.77
5.75	-0.0643	0.0290	0.0705	155.74	0.7433	0.2356	0.7798	17.59
5.80	-0.0638	0.0291	0.0701	155.51	0.7457	0.2338	0.7815	17.41
5.85	-0.0633	0.0291	0.0697	155.29	0.7480	0.2320	0.7831	17.23
5.90	-0.0628	0.0292	0.0692	155.07	0.7503	0.2302	0.7848	17.06
5.95	-0.0623	0.0292	0.0688	154.86	0.7525	0.2285	0.7864	16.89
6.00	-0.0618	0.0293	0.0684	154.65	0.7547	0.2268	0.7880	16.72
6.05	-0.0613	0.0293	0.0680	154.44	0.7569	0.2251	0.7896	16.56
6.10	-0.0608	0.0294	0.0676	154.24	0.7590	0.2234	0.7912	16.40
6.15	-0.0604	0.0294	0.0671	154.04	0.7611	0.2217	0.7927	16.24
6.20	-0.0599	0.0294	0.0667	153.84	0.7632	0.2201	0.7943	16.09
6.25	-0.0594	0.0294	0.0663	153.65	0.7652	0.2185	0.7958	15.94
6.30	-0.0590	0.0295	0.0659	153.46	0.7672	0.2169	0.7972	15.79
6.35	-0.0586	0.0295	0.0656	153.28	0.7691	0.2153	0.7987	15.64
6.40	-0.0581	0.0295	0.0652	153.10	0.7710	0.2138	0.8001	15.50
6.45	-0.0577	0.0295	0.0648	152.92	0.7729	0.2123	0.8015	15.36
6.50	-0.0573	0.0295	0.0644	152.74	0.7748	0.2107	0.8029	15.22
6.55	-0.0568	0.0295	0.0640	152.57	0.7766	0.2093	0.8043	15.08
6.60	-0.0564	0.0295	0.0637	152.40	0.7784	0.2078	0.8057	14.95
6.65	-0.0560	0.0295	0.0633	152.24	0.7802	0.2063	0.8070	14.81
6.70	-0.0556	0.0295	0.0629	152.08	0.7819	0.2049	0.8083	14.69
6.75	-0.0552	0.0295	0.0626	151.92	0.7836	0.2035	0.8096	14.56
6.80	-0.0548	0.0294	0.0622	151.76	0.7853	0.2021	0.8109	14.43
6.85	-0.0544	0.0294	0.0619	151.61	0.7870	0.2007	0.8122	14.31
6.90	-0.0540	0.0294	0.0615	151.45	0.7886	0.1994	0.8134	14.19
6.95	-0.0537	0.0294	0.0612	151.31	0.7902	0.1980	0.8147	14.07

$k = 0.1$ $\sigma = 0.00$									
a	$\frac{1-\sigma^2}{2}\cdot X$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	1.1895	-0.2955	0.9100	0.7688	0.4636	1.0533	-0.0293	1.0537	358.40
7.05	1.1883	-0.2927	0.9106	0.7624	0.4666	1.0529	-0.0293	1.0533	358.41
7.10	1.1872	-0.2899	0.9111	0.7561	0.4695	1.0525	-0.0293	1.0530	358.41
7.15	1.1861	-0.2872	0.9117	0.7499	0.4724	1.0522	-0.0292	1.0526	358.41
7.20	1.1849	-0.2845	0.9122	0.7437	0.4753	1.0518	-0.0292	1.0522	358.41
7.25	1.1838	-0.2819	0.9127	0.7377	0.4782	1.0515	-0.0292	1.0519	358.41
7.30	1.1827	-0.2793	0.9133	0.7318	0.4810	1.0511	-0.0291	1.0515	358.41
7.35	1.1816	-0.2767	0.9138	0.7260	0.4839	1.0508	-0.0291	1.0512	358.41
7.40	1.1806	-0.2743	0.9143	0.7202	0.4866	1.0505	-0.0290	1.0509	358.42
7.45	1.1795	-0.2718	0.9148	0.7146	0.4894	1.0501	-0.0290	1.0505	358.42
7.50	1.1784	-0.2694	0.9153	0.7090	0.4921	1.0498	-0.0290	1.0502	358.42
7.55	1.1774	-0.2670	0.9158	0.7035	0.4948	1.0495	-0.0289	1.0499	358.42
7.60	1.1764	-0.2647	0.9163	0.6981	0.4975	1.0491	-0.0289	1.0495	358.42
7.65	1.1754	-0.2624	0.9168	0.6928	0.5002	1.0488	-0.0288	1.0492	358.43
7.70	1.1743	-0.2601	0.9172	0.6876	0.5028	1.0485	-0.0288	1.0489	358.43
7.75	1.1733	-0.2579	0.9177	0.6824	0.5054	1.0482	-0.0287	1.0486	358.43
7.80	1.1724	-0.2557	0.9182	0.6773	0.5080	1.0479	-0.0286	1.0483	358.43
7.85	1.1714	-0.2536	0.9187	0.6723	0.5105	1.0476	-0.0286	1.0480	358.44
7.90	1.1704	-0.2515	0.9191	0.6673	0.5131	1.0473	-0.0285	1.0477	358.44
7.95	1.1695	-0.2494	0.9196	0.6625	0.5156	1.0470	-0.0285	1.0474	358.44
8.00	1.1685	-0.2473	0.9200	0.6577	0.5181	1.0467	-0.0284	1.0471	358.44
8.05	1.1676	-0.2453	0.9205	0.6529	0.5205	1.0464	-0.0284	1.0468	358.45
8.10	1.1666	-0.2433	0.9209	0.6483	0.5229	1.0461	-0.0283	1.0465	358.45
8.15	1.1657	-0.2414	0.9213	0.6437	0.5254	1.0459	-0.0282	1.0462	358.45
8.20	1.1648	-0.2394	0.9218	0.6391	0.5277	1.0456	-0.0282	1.0460	358.46
8.25	1.1639	-0.2376	0.9222	0.6347	0.5301	1.0453	-0.0281	1.0457	358.46
8.30	1.1630	-0.2357	0.9226	0.6302	0.5325	1.0450	-0.0281	1.0454	358.46
8.35	1.1621	-0.2338	0.9230	0.6259	0.5348	1.0448	-0.0280	1.0451	358.47
8.40	1.1613	-0.2320	0.9234	0.6216	0.5371	1.0445	-0.0279	1.0449	358.47
8.45	1.1604	-0.2303	0.9238	0.6174	0.5394	1.0442	-0.0279	1.0446	358.47
8.50	1.1595	-0.2285	0.9242	0.6132	0.5416	1.0440	-0.0278	1.0444	358.47
8.55	1.1587	-0.2268	0.9246	0.6091	0.5439	1.0437	-0.0277	1.0441	358.48
8.60	1.1578	-0.2251	0.9250	0.6050	0.5461	1.0435	-0.0277	1.0438	358.48
8.65	1.1570	-0.2234	0.9254	0.6010	0.5483	1.0432	-0.0276	1.0436	358.48
8.70	1.1562	-0.2217	0.9258	0.5970	0.5505	1.0430	-0.0275	1.0433	358.49
8.75	1.1554	-0.2201	0.9262	0.5931	0.5526	1.0427	-0.0275	1.0431	358.49
8.80	1.1546	-0.2185	0.9266	0.5892	0.5548	1.0425	-0.0274	1.0429	358.49
8.85	1.1538	-0.2169	0.9269	0.5854	0.5569	1.0423	-0.0273	1.0426	358.50
8.90	1.1530	-0.2153	0.9273	0.5816	0.5590	1.0420	-0.0273	1.0424	358.50
8.95	1.1522	-0.2138	0.9277	0.5779	0.5611	1.0418	-0.0272	1.0421	358.50
9.00	1.1514	-0.2122	0.9280	0.5743	0.5631	1.0416	-0.0271	1.0419	358.51
9.05	1.1506	-0.2107	0.9284	0.5706	0.5652	1.0413	-0.0271	1.0417	358.51
9.10	1.1499	-0.2093	0.9288	0.5671	0.5672	1.0411	-0.0270	1.0414	358.51
9.15	1.1491	-0.2078	0.9291	0.5635	0.5692	1.0409	-0.0269	1.0412	358.52
9.20	1.1484	-0.2064	0.9295	0.5600	0.5712	1.0407	-0.0269	1.0410	358.52
9.25	1.1476	-0.2049	0.9298	0.5566	0.5732	1.0404	-0.0268	1.0408	358.52
9.30	1.1469	-0.2035	0.9301	0.5532	0.5751	1.0402	-0.0267	1.0406	358.53
9.35	1.1462	-0.2021	0.9305	0.5498	0.5771	1.0400	-0.0267	1.0403	358.53
9.40	1.1454	-0.2008	0.9308	0.5465	0.5790	1.0398	-0.0266	1.0401	358.54
9.45	1.1447	-0.1994	0.9311	0.5432	0.5809	1.0396	-0.0265	1.0399	358.54
9.50	1.1440	-0.1981	0.9315	0.5399	0.5828	1.0394	-0.0265	1.0397	358.54
9.55	1.1433	-0.1968	0.9318	0.5367	0.5847	1.0392	-0.0264	1.0395	358.55
9.60	1.1426	-0.1955	0.9321	0.5336	0.5865	1.0390	-0.0263	1.0393	358.55
9.65	1.1419	-0.1942	0.9324	0.5304	0.5884	1.0388	-0.0262	1.0391	358.55
9.70	1.1413	-0.1929	0.9328	0.5273	0.5902	1.0386	-0.0262	1.0389	358.56
9.75	1.1406	-0.1917	0.9331	0.5243	0.5920	1.0384	-0.0261	1.0387	358.56
9.80	1.1399	-0.1904	0.9334	0.5212	0.5938	1.0382	-0.0260	1.0385	358.56
9.85	1.1392	-0.1892	0.9337	0.5182	0.5956	1.0380	-0.0260	1.0383	358.57
9.90	1.1386	-0.1880	0.9340	0.5153	0.5973	1.0378	-0.0259	1.0381	358.57
9.95	1.1379	-0.1868	0.9343	0.5123	0.5991	1.0376	-0.0258	1.0379	358.57
10.00	1.1373	-0.1856	0.9346	0.5095	0.6008	1.0374	-0.0258	1.0377	358.58

$k = 0.1$ $\sigma = 0.00$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	-0.0533	0.0293	0.0608	151.16	0.7918	0.1967	0.8159	13.95
7.05	-0.0529	0.0293	0.0605	151.02	0.7934	0.1954	0.8171	13.84
7.10	-0.0525	0.0293	0.0602	150.87	0.7949	0.1941	0.8183	13.72
7.15	-0.0522	0.0292	0.0598	150.74	0.7964	0.1928	0.8195	13.61
7.20	-0.0518	0.0292	0.0595	150.60	0.7979	0.1916	0.8206	13.50
7.25	-0.0515	0.0292	0.0592	150.46	0.7994	0.1903	0.8217	13.39
7.30	-0.0511	0.0291	0.0589	150.33	0.8008	0.1891	0.8229	13.29
7.35	-0.0508	0.0291	0.0585	150.20	0.8023	0.1879	0.8240	13.18
7.40	-0.0505	0.0290	0.0582	150.07	0.8037	0.1867	0.8251	13.08
7.45	-0.0501	0.0290	0.0579	149.95	0.8051	0.1855	0.8262	12.98
7.50	-0.0498	0.0290	0.0576	149.82	0.8064	0.1843	0.8272	12.88
7.55	-0.0495	0.0289	0.0573	149.70	0.8078	0.1832	0.8283	12.78
7.60	-0.0491	0.0289	0.0570	149.58	0.8091	0.1820	0.8293	12.68
7.65	-0.0488	0.0288	0.0567	149.46	0.8104	0.1809	0.8304	12.58
7.70	-0.0485	0.0288	0.0564	149.35	0.8117	0.1798	0.8314	12.49
7.75	-0.0482	0.0287	0.0561	149.23	0.8130	0.1787	0.8324	12.40
7.80	-0.0479	0.0286	0.0558	149.12	0.8142	0.1776	0.8334	12.30
7.85	-0.0476	0.0286	0.0555	149.01	0.8155	0.1765	0.8344	12.21
7.90	-0.0473	0.0285	0.0552	148.90	0.8167	0.1755	0.8353	12.13
7.95	-0.0470	0.0285	0.0550	148.79	0.8179	0.1744	0.8363	12.04
8.00	-0.0467	0.0284	0.0547	148.69	0.8191	0.1734	0.8372	11.95
8.05	-0.0464	0.0284	0.0544	148.58	0.8203	0.1723	0.8382	11.87
8.10	-0.0461	0.0283	0.0541	148.48	0.8214	0.1713	0.8391	11.78
8.15	-0.0459	0.0282	0.0539	148.38	0.8226	0.1703	0.8400	11.70
8.20	-0.0456	0.0282	0.0536	148.28	0.8237	0.1693	0.8409	11.62
8.25	-0.0453	0.0281	0.0533	148.18	0.8248	0.1683	0.8418	11.54
8.30	-0.0450	0.0281	0.0531	148.08	0.8259	0.1674	0.8427	11.46
8.35	-0.0448	0.0280	0.0528	147.99	0.8270	0.1664	0.8436	11.38
8.40	-0.0445	0.0279	0.0525	147.89	0.8281	0.1655	0.8444	11.30
8.45	-0.0442	0.0279	0.0523	147.80	0.8291	0.1645	0.8453	11.22
8.50	-0.0440	0.0278	0.0520	147.71	0.8302	0.1636	0.8461	11.15
8.55	-0.0437	0.0277	0.0518	147.62	0.8312	0.1627	0.8470	11.07
8.60	-0.0435	0.0277	0.0515	147.53	0.8322	0.1618	0.8478	11.00
8.65	-0.0432	0.0276	0.0513	147.44	0.8332	0.1609	0.8486	10.93
8.70	-0.0430	0.0275	0.0510	147.35	0.8342	0.1600	0.8494	10.86
8.75	-0.0427	0.0275	0.0508	147.27	0.8352	0.1591	0.8502	10.78
8.80	-0.0425	0.0274	0.0506	147.18	0.8362	0.1582	0.8510	10.71
8.85	-0.0423	0.0273	0.0503	147.10	0.8372	0.1574	0.8518	10.65
8.90	-0.0420	0.0273	0.0501	147.02	0.8381	0.1565	0.8526	10.58
8.95	-0.0418	0.0272	0.0499	146.93	0.8390	0.1557	0.8534	10.51
9.00	-0.0416	0.0271	0.0496	146.85	0.8400	0.1548	0.8541	10.44
9.05	-0.0413	0.0271	0.0494	146.78	0.8409	0.1540	0.8549	10.38
9.10	-0.0411	0.0270	0.0492	146.70	0.8418	0.1532	0.8556	10.31
9.15	-0.0409	0.0269	0.0490	146.62	0.8427	0.1524	0.8563	10.25
9.20	-0.0407	0.0269	0.0487	146.54	0.8436	0.1516	0.8571	10.19
9.25	-0.0404	0.0268	0.0485	146.47	0.8444	0.1508	0.8578	10.12
9.30	-0.0402	0.0267	0.0483	146.39	0.8453	0.1500	0.8585	10.06
9.35	-0.0400	0.0267	0.0481	146.32	0.8462	0.1492	0.8592	10.00
9.40	-0.0398	0.0266	0.0479	146.25	0.8470	0.1485	0.8599	9.94
9.45	-0.0396	0.0265	0.0476	146.18	0.8478	0.1477	0.8606	9.88
9.50	-0.0394	0.0265	0.0474	146.11	0.8487	0.1469	0.8613	9.82
9.55	-0.0392	0.0264	0.0472	146.04	0.8495	0.1462	0.8620	9.77
9.60	-0.0390	0.0263	0.0470	145.97	0.8503	0.1455	0.8626	9.71
9.65	-0.0388	0.0262	0.0468	145.90	0.8511	0.1447	0.8633	9.65
9.70	-0.0386	0.0262	0.0466	145.83	0.8519	0.1440	0.8640	9.59
9.75	-0.0384	0.0261	0.0464	145.77	0.8527	0.1433	0.8646	9.54
9.80	-0.0382	0.0260	0.0462	145.70	0.8534	0.1426	0.8653	9.48
9.85	-0.0380	0.0260	0.0460	145.64	0.8542	0.1419	0.8659	9.43
9.90	-0.0378	0.0259	0.0458	145.57	0.8550	0.1412	0.8665	9.38
9.95	-0.0376	0.0258	0.0456	145.51	0.8557	0.1405	0.8672	9.32
10.00	-0.0374	0.0258	0.0454	145.44	0.8565	0.1398	0.8678	9.27

$k = 0.1$ $\sigma = 0.25$									
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.1040	-7.9860	0.4671	5.4743	0.0042	1.0053	0.0145	1.0054	0.83
1.05	1.1044	-7.2408	0.4871	5.3975	0.0045	1.0064	0.0158	1.0065	0.90
1.10	1.1049	-6.5947	0.5066	5.3180	0.0049	1.0076	0.0170	1.0078	0.97
1.15	1.1054	-6.0308	0.5257	5.2362	0.0053	1.0090	0.0182	1.0092	1.03
1.20	1.1061	-5.5356	0.5443	5.1519	0.0058	1.0106	0.0193	1.0108	1.10
1.25	1.1068	-5.0985	0.5624	5.0656	0.0063	1.0123	0.0204	1.0125	1.15
1.30	1.1075	-4.7105	0.5799	4.9772	0.0069	1.0142	0.0214	1.0145	1.21
1.35	1.1084	-4.3647	0.5970	4.8870	0.0075	1.0163	0.0222	1.0166	1.25
1.40	1.1094	-4.0551	0.6135	4.7951	0.0083	1.0185	0.0229	1.0188	1.29
1.45	1.1105	-3.7767	0.6295	4.7017	0.0091	1.0209	0.0235	1.0212	1.32
1.50	1.1116	-3.5256	0.6449	4.6070	0.0100	1.0235	0.0238	1.0238	1.33
1.55	1.1129	-3.2982	0.6598	4.5111	0.0110	1.0262	0.0239	1.0264	1.34
1.60	1.1143	-3.0916	0.6742	4.4141	0.0121	1.0289	0.0238	1.0292	1.33
1.65	1.1159	-2.9033	0.6879	4.3164	0.0133	1.0318	0.0234	1.0321	1.30
1.70	1.1175	-2.7314	0.7011	4.2180	0.0147	1.0348	0.0228	1.0350	1.26
1.75	1.1193	-2.5738	0.7137	4.1192	0.0163	1.0377	0.0218	1.0380	1.20
1.80	1.1212	-2.4291	0.7258	4.0200	0.0180	1.0407	0.0205	1.0409	1.13
1.85	1.1233	-2.2959	0.7373	3.9208	0.0198	1.0437	0.0189	1.0438	1.04
1.90	1.1254	-2.1730	0.7482	3.8218	0.0219	1.0465	0.0169	1.0467	0.93
1.95	1.1277	-2.0595	0.7586	3.7230	0.0242	1.0493	0.0146	1.0494	0.80
2.00	1.1301	-1.9544	0.7684	3.6248	0.0267	1.0519	0.0120	1.0519	0.65
2.05	1.1326	-1.8568	0.7776	3.5272	0.0294	1.0542	0.0091	1.0543	0.50
2.10	1.1353	-1.7663	0.7863	3.4306	0.0324	1.0564	0.0059	1.0564	0.32
2.15	1.1380	-1.6820	0.7945	3.3351	0.0356	1.0583	0.0025	1.0583	0.14
2.20	1.1408	-1.6035	0.8021	3.2410	0.0391	1.0598	-0.0011	1.0598	359.94
2.25	1.1437	-1.5304	0.8092	3.1483	0.0429	1.0611	-0.0050	1.0611	359.73
2.30	1.1466	-1.4620	0.8159	3.0574	0.0470	1.0620	-0.0089	1.0620	359.52
2.35	1.1496	-1.3982	0.8220	2.9683	0.0514	1.0625	-0.0130	1.0626	359.30
2.40	1.1526	-1.3385	0.8278	2.8812	0.0561	1.0627	-0.0171	1.0628	359.08
2.45	1.1556	-1.2826	0.8330	2.7963	0.0610	1.0625	-0.0212	1.0627	358.86
2.50	1.1586	-1.2302	0.8379	2.7136	0.0663	1.0619	-0.0252	1.0622	358.64
2.55	1.1615	-1.1811	0.8424	2.6334	0.0718	1.0611	-0.0292	1.0615	358.43
2.60	1.1644	-1.1350	0.8466	2.5556	0.0776	1.0599	-0.0330	1.0604	358.22
2.65	1.1673	-1.0917	0.8504	2.4803	0.0837	1.0584	-0.0367	1.0590	358.01
2.70	1.1700	-1.0510	0.8539	2.4077	0.0900	1.0567	-0.0402	1.0574	357.82
2.75	1.1727	-1.0128	0.8571	2.3376	0.0966	1.0547	-0.0435	1.0556	357.64
2.80	1.1753	-0.9768	0.8601	2.2701	0.1033	1.0526	-0.0466	1.0536	357.46
2.85	1.1778	-0.9429	0.8628	2.2052	0.1102	1.0503	-0.0495	1.0515	357.30
2.90	1.1801	-0.9109	0.8653	2.1429	0.1173	1.0479	-0.0522	1.0492	357.15
2.95	1.1823	-0.8807	0.8677	2.0831	0.1245	1.0453	-0.0547	1.0467	357.01
3.00	1.1844	-0.8523	0.8698	2.0257	0.1319	1.0427	-0.0569	1.0443	356.88
3.05	1.1863	-0.8254	0.8718	1.9707	0.1394	1.0400	-0.0589	1.0417	356.76
3.10	1.1881	-0.7999	0.8736	1.9181	0.1469	1.0373	-0.0607	1.0391	356.65
3.15	1.1898	-0.7759	0.8754	1.8677	0.1545	1.0346	-0.0623	1.0365	356.55
3.20	1.1913	-0.7531	0.8770	1.8194	0.1621	1.0319	-0.0638	1.0339	356.46
3.25	1.1927	-0.7315	0.8785	1.7733	0.1698	1.0293	-0.0650	1.0313	356.38
3.30	1.1939	-0.7110	0.8799	1.7291	0.1774	1.0266	-0.0661	1.0287	356.31
3.35	1.1950	-0.6915	0.8812	1.6868	0.1851	1.0240	-0.0671	1.0262	356.25
3.40	1.1960	-0.6730	0.8824	1.6464	0.1927	1.0214	-0.0679	1.0237	356.20
3.45	1.1968	-0.6554	0.8836	1.6077	0.2004	1.0189	-0.0686	1.0212	356.15
3.50	1.1976	-0.6386	0.8848	1.5706	0.2079	1.0164	-0.0692	1.0188	356.11
3.55	1.1982	-0.6227	0.8859	1.5352	0.2154	1.0140	-0.0697	1.0164	356.07
3.60	1.1987	-0.6075	0.8869	1.5012	0.2229	1.0117	-0.0701	1.0141	356.04
3.65	1.1991	-0.5929	0.8879	1.4686	0.2302	1.0094	-0.0704	1.0119	356.01
3.70	1.1994	-0.5791	0.8889	1.4374	0.2375	1.0072	-0.0706	1.0097	355.99
3.75	1.1996	-0.5658	0.8898	1.4075	0.2448	1.0051	-0.0708	1.0076	355.97
3.80	1.1997	-0.5532	0.8907	1.3788	0.2519	1.0030	-0.0709	1.0055	355.96
3.85	1.1997	-0.5410	0.8916	1.3512	0.2589	1.0010	-0.0709	1.0035	355.95
3.90	1.1996	-0.5294	0.8925	1.3248	0.2659	0.9990	-0.0709	1.0016	355.94
3.95	1.1995	-0.5183	0.8933	1.2993	0.2727	0.9971	-0.0709	0.9997	355.93

$k = 0.1$ $\sigma = 0.25$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0053	-0.0145	0.0155	249.98	0.0133	0.1079	0.1087	82.99
1.05	-0.0064	-0.0158	0.0170	247.94	0.0161	0.1186	0.1197	82.27
1.10	-0.0076	-0.0170	0.0186	245.80	0.0193	0.1298	0.1312	81.52
1.15	-0.0090	-0.0182	0.0203	243.57	0.0230	0.1413	0.1432	80.74
1.20	-0.0106	-0.0193	0.0220	241.24	0.0272	0.1532	0.1556	79.92
1.25	-0.0123	-0.0204	0.0238	238.83	0.0320	0.1654	0.1685	79.07
1.30	-0.0142	-0.0214	0.0257	236.32	0.0372	0.1779	0.1818	78.18
1.35	-0.0163	-0.0222	0.0276	233.72	0.0431	0.1907	0.1955	77.27
1.40	-0.0185	-0.0229	0.0295	231.03	0.0496	0.2036	0.2096	76.32
1.45	-0.0209	-0.0235	0.0314	228.26	0.0567	0.2167	0.2240	75.34
1.50	-0.0235	-0.0238	0.0334	225.40	0.0645	0.2300	0.2388	74.33
1.55	-0.0262	-0.0239	0.0355	222.47	0.0730	0.2432	0.2540	73.29
1.60	-0.0289	-0.0238	0.0375	219.46	0.0823	0.2565	0.2693	72.22
1.65	-0.0318	-0.0234	0.0395	216.37	0.0922	0.2696	0.2850	71.12
1.70	-0.0348	-0.0228	0.0416	213.21	0.1029	0.2826	0.3008	69.99
1.75	-0.0377	-0.0218	0.0436	209.99	0.1143	0.2954	0.3168	68.84
1.80	-0.0407	-0.0205	0.0456	206.70	0.1265	0.3079	0.3329	67.67
1.85	-0.0437	-0.0189	0.0476	203.36	0.1394	0.3200	0.3491	66.47
1.90	-0.0465	-0.0169	0.0495	199.97	0.1529	0.3317	0.3653	65.25
1.95	-0.0493	-0.0146	0.0514	196.53	0.1671	0.3429	0.3815	64.02
2.00	-0.0519	-0.0120	0.0532	193.05	0.1819	0.3535	0.3976	62.76
2.05	-0.0542	-0.0091	0.0550	189.54	0.1973	0.3634	0.4135	61.50
2.10	-0.0564	-0.0059	0.0567	186.01	0.2132	0.3726	0.4293	60.22
2.15	-0.0583	-0.0025	0.0583	182.47	0.2296	0.3811	0.4449	58.94
2.20	-0.0598	0.0011	0.0598	178.91	0.2462	0.3887	0.4602	57.65
2.25	-0.0611	0.0050	0.0613	175.35	0.2632	0.3956	0.4751	56.36
2.30	-0.0620	0.0089	0.0626	171.81	0.2804	0.4015	0.4897	55.07
2.35	-0.0625	0.0130	0.0638	168.27	0.2977	0.4065	0.5039	53.79
2.40	-0.0627	0.0171	0.0649	164.77	0.3150	0.4107	0.5176	52.51
2.45	-0.0625	0.0212	0.0660	161.29	0.3323	0.4140	0.5309	51.25
2.50	-0.0619	0.0252	0.0669	157.86	0.3494	0.4165	0.5436	50.01
2.55	-0.0611	0.0292	0.0677	154.47	0.3663	0.4181	0.5559	48.78
2.60	-0.0599	0.0330	0.0684	151.14	0.3829	0.4189	0.5676	47.57
2.65	-0.0584	0.0367	0.0690	147.86	0.3992	0.4190	0.5787	46.39
2.70	-0.0567	0.0402	0.0695	144.65	0.4151	0.4184	0.5894	45.23
2.75	-0.0547	0.0435	0.0699	141.51	0.4305	0.4172	0.5995	44.10
2.80	-0.0526	0.0466	0.0703	138.43	0.4455	0.4154	0.6091	43.00
2.85	-0.0503	0.0495	0.0706	135.43	0.4600	0.4131	0.6183	41.93
2.90	-0.0479	0.0522	0.0708	132.51	0.4739	0.4104	0.6269	40.89
2.95	-0.0453	0.0547	0.0710	129.66	0.4873	0.4072	0.6350	39.88
3.00	-0.0427	0.0569	0.0711	126.90	0.5002	0.4037	0.6428	38.91
3.05	-0.0400	0.0589	0.0712	124.21	0.5126	0.3999	0.6501	37.97
3.10	-0.0373	0.0607	0.0713	121.59	0.5243	0.3959	0.6570	37.06
3.15	-0.0346	0.0623	0.0713	119.06	0.5355	0.3917	0.6635	36.18
3.20	-0.0319	0.0638	0.0713	116.60	0.5463	0.3873	0.6697	35.34
3.25	-0.0293	0.0650	0.0713	114.22	0.5566	0.3828	0.6755	34.52
3.30	-0.0266	0.0661	0.0713	111.91	0.5664	0.3783	0.6811	33.74
3.35	-0.0240	0.0671	0.0713	109.67	0.5757	0.3736	0.6863	32.98
3.40	-0.0214	0.0679	0.0712	107.50	0.5847	0.3690	0.6913	32.26
3.45	-0.0189	0.0686	0.0712	105.40	0.5932	0.3643	0.6961	31.56
3.50	-0.0164	0.0692	0.0711	103.37	0.6013	0.3596	0.7006	30.88
3.55	-0.0140	0.0697	0.0711	101.40	0.6090	0.3550	0.7049	30.24
3.60	-0.0117	0.0701	0.0710	99.49	0.6164	0.3504	0.7090	29.61
3.65	-0.0094	0.0704	0.0710	97.64	0.6235	0.3458	0.7130	29.02
3.70	-0.0072	0.0706	0.0710	95.85	0.6303	0.3413	0.7168	28.44
3.75	-0.0051	0.0708	0.0709	94.12	0.6367	0.3369	0.7204	27.89
3.80	-0.0030	0.0709	0.0709	92.44	0.6429	0.3326	0.7239	27.35
3.85	-0.0010	0.0709	0.0709	90.81	0.6489	0.3283	0.7272	26.84
3.90	0.0010	0.0709	0.0709	89.23	0.6546	0.3241	0.7304	26.34
3.95	0.0029	0.0709	0.0709	87.70	0.6601	0.3200	0.7335	25.87

$k = 0.1$ $\sigma = 0.25$

a	$\frac{1-\sigma^2}{2} \cdot X$ REAL	$\frac{1-\sigma^2}{2} \cdot X$ IMAG.	$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
4.00	1.1993	-0.5076	0.8942	1.2749	0.2795	0.9953	-0.0708	0.9978	355.93
4.05	1.1990	-0.4973	0.8950	1.2514	0.2861	0.9935	-0.0707	0.9960	355.93
4.10	1.1986	-0.4874	0.8958	1.2288	0.2927	0.9918	-0.0706	0.9943	355.93
4.15	1.1982	-0.4780	0.8966	1.2070	0.2991	0.9901	-0.0704	0.9926	355.93
4.20	1.1977	-0.4688	0.8973	1.1860	0.3054	0.9885	-0.0702	0.9910	355.94
4.25	1.1971	-0.4601	0.8981	1.1658	0.3117	0.9869	-0.0700	0.9894	355.94
4.30	1.1965	-0.4516	0.8988	1.1462	0.3178	0.9854	-0.0698	0.9879	355.95
4.35	1.1959	-0.4434	0.8996	1.1274	0.3239	0.9839	-0.0696	0.9864	355.96
4.40	1.1952	-0.4356	0.9003	1.1092	0.3298	0.9824	-0.0693	0.9849	355.96
4.45	1.1945	-0.4280	0.9011	1.0916	0.3357	0.9810	-0.0691	0.9835	355.97
4.50	1.1937	-0.4206	0.9018	1.0746	0.3414	0.9797	-0.0688	0.9821	355.98
4.55	1.1929	-0.4135	0.9025	1.0581	0.3471	0.9783	-0.0685	0.9807	355.99
4.60	1.1921	-0.4066	0.9032	1.0422	0.3527	0.9770	-0.0682	0.9794	356.00
4.65	1.1913	-0.4000	0.9039	1.0267	0.3582	0.9758	-0.0680	0.9781	356.02
4.70	1.1904	-0.3936	0.9046	1.0118	0.3636	0.9745	-0.0677	0.9769	356.03
4.75	1.1895	-0.3873	0.9053	0.9973	0.3689	0.9733	-0.0674	0.9757	356.04
4.80	1.1885	-0.3813	0.9060	0.9832	0.3741	0.9722	-0.0671	0.9745	356.05
4.85	1.1876	-0.3754	0.9066	0.9695	0.3793	0.9710	-0.0668	0.9733	356.07
4.90	1.1866	-0.3697	0.9073	0.9562	0.3843	0.9699	-0.0665	0.9722	356.08
4.95	1.1856	-0.3642	0.9080	0.9433	0.3893	0.9688	-0.0662	0.9710	356.09
5.00	1.1846	-0.3588	0.9086	0.9308	0.3943	0.9677	-0.0658	0.9700	356.11
5.05	1.1836	-0.3536	0.9093	0.9186	0.3991	0.9667	-0.0655	0.9689	356.12
5.10	1.1826	-0.3486	0.9099	0.9067	0.4039	0.9656	-0.0652	0.9678	356.14
5.15	1.1816	-0.3436	0.9106	0.8951	0.4086	0.9646	-0.0649	0.9668	356.15
5.20	1.1805	-0.3388	0.9112	0.8838	0.4132	0.9637	-0.0646	0.9658	356.16
5.25	1.1795	-0.3341	0.9119	0.8728	0.4178	0.9627	-0.0643	0.9648	356.18
5.30	1.1784	-0.3296	0.9125	0.8621	0.4223	0.9618	-0.0640	0.9639	356.19
5.35	1.1774	-0.3251	0.9131	0.8517	0.4267	0.9608	-0.0637	0.9629	356.21
5.40	1.1763	-0.3208	0.9137	0.8415	0.4311	0.9599	-0.0634	0.9620	356.22
5.45	1.1753	-0.3166	0.9143	0.8315	0.4354	0.9590	-0.0630	0.9611	356.24
5.50	1.1742	-0.3125	0.9149	0.8218	0.4397	0.9582	-0.0627	0.9602	356.25
5.55	1.1732	-0.3085	0.9155	0.8123	0.4439	0.9573	-0.0624	0.9593	356.27
5.60	1.1721	-0.3046	0.9161	0.8030	0.4480	0.9565	-0.0621	0.9585	356.28
5.65	1.1711	-0.3007	0.9167	0.7939	0.4521	0.9557	-0.0618	0.9576	356.30
5.70	1.1700	-0.2970	0.9173	0.7850	0.4561	0.9548	-0.0615	0.9568	356.32
5.75	1.1690	-0.2934	0.9178	0.7763	0.4601	0.9541	-0.0612	0.9560	356.33
5.80	1.1679	-0.2898	0.9184	0.7678	0.4640	0.9533	-0.0609	0.9552	356.35
5.85	1.1669	-0.2863	0.9189	0.7595	0.4679	0.9525	-0.0606	0.9544	356.36
5.90	1.1659	-0.2829	0.9195	0.7514	0.4717	0.9518	-0.0603	0.9537	356.38
5.95	1.1649	-0.2796	0.9200	0.7434	0.4755	0.9510	-0.0600	0.9529	356.39
6.00	1.1638	-0.2763	0.9206	0.7356	0.4792	0.9503	-0.0597	0.9522	356.41
6.05	1.1628	-0.2731	0.9211	0.7280	0.4829	0.9496	-0.0594	0.9514	356.42
6.10	1.1618	-0.2700	0.9216	0.7205	0.4865	0.9489	-0.0591	0.9507	356.44
6.15	1.1608	-0.2669	0.9221	0.7131	0.4901	0.9482	-0.0588	0.9500	356.45
6.20	1.1598	-0.2639	0.9227	0.7059	0.4937	0.9475	-0.0585	0.9493	356.47
6.25	1.1589	-0.2610	0.9232	0.6988	0.4972	0.9468	-0.0582	0.9486	356.48
6.30	1.1579	-0.2581	0.9237	0.6919	0.5006	0.9462	-0.0579	0.9480	356.50
6.35	1.1569	-0.2553	0.9242	0.6851	0.5040	0.9455	-0.0576	0.9473	356.52
6.40	1.1560	-0.2526	0.9247	0.6784	0.5074	0.9449	-0.0573	0.9466	356.53
6.45	1.1550	-0.2499	0.9251	0.6719	0.5107	0.9443	-0.0570	0.9460	356.55
6.50	1.1541	-0.2472	0.9256	0.6655	0.5140	0.9437	-0.0567	0.9454	356.56
6.55	1.1531	-0.2446	0.9261	0.6592	0.5173	0.9431	-0.0564	0.9448	356.58
6.60	1.1522	-0.2421	0.9266	0.6530	0.5205	0.9425	-0.0561	0.9441	356.59
6.65	1.1513	-0.2396	0.9270	0.6469	0.5237	0.9419	-0.0559	0.9435	356.61
6.70	1.1504	-0.2372	0.9275	0.6409	0.5268	0.9413	-0.0556	0.9429	356.62
6.75	1.1495	-0.2348	0.9279	0.6350	0.5299	0.9407	-0.0553	0.9424	356.64
6.80	1.1486	-0.2324	0.9284	0.6293	0.5330	0.9402	-0.0550	0.9418	356.65
6.85	1.1477	-0.2301	0.9288	0.6236	0.5360	0.9396	-0.0547	0.9412	356.67
6.90	1.1469	-0.2278	0.9293	0.6181	0.5390	0.9391	-0.0545	0.9407	356.68
6.95	1.1460	-0.2256	0.9297	0.6126	0.5420	0.9386	-0.0542	0.9401	356.70

$k=$ 0.1					$\sigma=$ 0.25			
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.0047	0.0708	0.0710	86.21	0.6653	0.3160	0.7365	25.41
4.05	0.0065	0.0707	0.0710	84.77	0.6704	0.3121	0.7395	24.96
4.10	0.0082	0.0706	0.0710	83.37	0.6753	0.3082	0.7423	24.54
4.15	0.0099	0.0704	0.0711	82.02	0.6800	0.3045	0.7450	24.12
4.20	0.0115	0.0702	0.0712	80.70	0.6845	0.3008	0.7477	23.72
4.25	0.0131	0.0700	0.0712	79.42	0.6889	0.2972	0.7503	23.34
4.30	0.0146	0.0698	0.0713	78.17	0.6931	0.2937	0.7528	22.97
4.35	0.0161	0.0696	0.0714	76.97	0.6972	0.2903	0.7553	22.61
4.40	0.0176	0.0693	0.0715	75.79	0.7012	0.2870	0.7577	22.26
4.45	0.0190	0.0691	0.0716	74.65	0.7050	0.2837	0.7600	21.92
4.50	0.0203	0.0688	0.0717	73.54	0.7088	0.2806	0.7623	21.60
4.55	0.0217	0.0685	0.0719	72.45	0.7124	0.2775	0.7645	21.28
4.60	0.0230	0.0682	0.0720	71.40	0.7159	0.2744	0.7667	20.97
4.65	0.0242	0.0680	0.0722	70.37	0.7194	0.2715	0.7689	20.67
4.70	0.0255	0.0677	0.0723	69.38	0.7227	0.2686	0.7710	20.39
4.75	0.0267	0.0674	0.0725	68.40	0.7259	0.2657	0.7731	20.11
4.80	0.0278	0.0671	0.0726	67.45	0.7291	0.2630	0.7751	19.83
4.85	0.0290	0.0668	0.0728	66.53	0.7322	0.2603	0.7771	19.57
4.90	0.0301	0.0665	0.0730	65.62	0.7352	0.2576	0.7790	19.31
4.95	0.0312	0.0662	0.0731	64.74	0.7382	0.2550	0.7810	19.06
5.00	0.0323	0.0658	0.0733	63.86	0.7410	0.2525	0.7829	18.82
5.05	0.0333	0.0655	0.0735	63.04	0.7438	0.2500	0.7847	18.58
5.10	0.0344	0.0652	0.0737	62.22	0.7466	0.2476	0.7866	18.35
5.15	0.0354	0.0649	0.0739	61.42	0.7493	0.2452	0.7884	18.12
5.20	0.0363	0.0646	0.0741	60.64	0.7519	0.2429	0.7901	17.90
5.25	0.0373	0.0643	0.0743	59.88	0.7544	0.2406	0.7919	17.69
5.30	0.0382	0.0640	0.0745	59.13	0.7570	0.2383	0.7936	17.48
5.35	0.0392	0.0637	0.0747	58.40	0.7594	0.2361	0.7953	17.27
5.40	0.0401	0.0634	0.0750	57.68	0.7618	0.2340	0.7970	17.07
5.45	0.0410	0.0630	0.0752	56.99	0.7642	0.2319	0.7986	16.88
5.50	0.0418	0.0627	0.0754	56.30	0.7665	0.2298	0.8002	16.69
5.55	0.0427	0.0624	0.0756	55.63	0.7688	0.2277	0.8018	16.50
5.60	0.0435	0.0621	0.0758	54.98	0.7710	0.2257	0.8034	16.32
5.65	0.0443	0.0618	0.0761	54.34	0.7732	0.2238	0.8049	16.14
5.70	0.0452	0.0615	0.0763	53.71	0.7753	0.2218	0.8065	15.97
5.75	0.0459	0.0612	0.0765	53.09	0.7774	0.2199	0.8080	15.80
5.80	0.0467	0.0609	0.0767	52.49	0.7795	0.2181	0.8094	15.63
5.85	0.0475	0.0606	0.0770	51.90	0.7815	0.2162	0.8109	15.46
5.90	0.0482	0.0603	0.0772	51.32	0.7835	0.2144	0.8123	15.30
5.95	0.0490	0.0600	0.0774	50.75	0.7855	0.2126	0.8138	15.15
6.00	0.0497	0.0597	0.0777	50.20	0.7874	0.2109	0.8151	14.99
6.05	0.0504	0.0594	0.0779	49.65	0.7893	0.2091	0.8165	14.84
6.10	0.0511	0.0591	0.0781	49.12	0.7911	0.2074	0.8179	14.69
6.15	0.0518	0.0588	0.0783	48.59	0.7930	0.2058	0.8192	14.55
6.20	0.0525	0.0585	0.0786	48.08	0.7947	0.2041	0.8205	14.40
6.25	0.0532	0.0582	0.0788	47.58	0.7965	0.2025	0.8218	14.26
6.30	0.0538	0.0579	0.0790	47.08	0.7982	0.2009	0.8231	14.13
6.35	0.0545	0.0576	0.0793	46.60	0.7999	0.1993	0.8244	13.99
6.40	0.0551	0.0573	0.0795	46.12	0.8016	0.1978	0.8256	13.86
6.45	0.0557	0.0570	0.0797	45.65	0.8032	0.1962	0.8269	13.73
6.50	0.0563	0.0567	0.0799	45.19	0.8049	0.1947	0.8281	13.60
6.55	0.0569	0.0564	0.0802	44.74	0.8064	0.1933	0.8293	13.48
6.60	0.0575	0.0561	0.0804	44.30	0.8080	0.1918	0.8305	13.35
6.65	0.0581	0.0559	0.0806	43.86	0.8095	0.1904	0.8316	13.23
6.70	0.0587	0.0556	0.0808	43.44	0.8111	0.1889	0.8328	13.11
6.75	0.0593	0.0553	0.0810	43.02	0.8125	0.1875	0.8339	13.00
6.80	0.0598	0.0550	0.0813	42.61	0.8140	0.1862	0.8350	12.88
6.85	0.0604	0.0547	0.0815	42.20	0.8154	0.1848	0.8361	12.77
6.90	0.0609	0.0545	0.0817	41.80	0.8169	0.1835	0.8372	12.66
6.95	0.0614	0.0542	0.0819	41.41	0.8183	0.1821	0.8383	12.55

	$k = 0.1$ $\sigma = 0.25$								
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	1.1451	-0.2234	0.9301	0.6072	0.5449	0.9380	-0.0539	0.9396	356.71
7.05	1.1443	-0.2213	0.9305	0.6019	0.5478	0.9375	-0.0537	0.9391	356.72
7.10	1.1435	-0.2192	0.9309	0.5967	0.5506	0.9370	-0.0534	0.9385	356.74
7.15	1.1426	-0.2171	0.9314	0.5916	0.5534	0.9365	-0.0531	0.9380	356.75
7.20	1.1418	-0.2151	0.9318	0.5866	0.5562	0.9360	-0.0529	0.9375	356.77
7.25	1.1410	-0.2131	0.9322	0.5816	0.5590	0.9355	-0.0526	0.9370	356.78
7.30	1.1402	-0.2111	0.9326	0.5768	0.5617	0.9350	-0.0523	0.9365	356.80
7.35	[illegible]	-0.2092	0.9329	0.5720	0.5644	0.9346	-0.0521	0.9360	356.81
7.40	1.1386	-0.2073	0.9333	0.5673	0.5671	0.9341	-0.0518	0.9355	356.82
7.45	1.1378	-0.2054	0.9337	0.5627	0.5697	0.9336	-0.0516	0.9351	356.84
7.50	1.1370	-0.2036	0.9341	0.5581	0.5723	0.9332	-0.0513	0.9346	356.85
7.55	1.1363	-0.2018	0.9345	0.5536	0.5749	0.9327	-0.0511	0.9341	356.87
7.60	1.1355	-0.2000	0.9348	0.5492	0.5774	0.9323	-0.0508	0.9337	356.88
7.65	1.1348	-0.1983	0.9352	0.5448	0.5799	0.9319	-0.0506	0.9332	356.89
7.70	1.1340	-0.1966	0.9356	0.5406	0.5824	0.9314	-0.0503	0.9328	356.91
7.75	1.1333	-0.1949	0.9359	0.5363	0.5849	0.9310	-0.0501	0.9324	356.92
7.80	1.1326	-0.1932	0.9363	0.5322	0.5873	0.9306	-0.0498	0.9319	356.93
7.85	1.1318	-0.1916	0.9366	0.5281	0.5897	0.9302	-0.0496	0.9315	356.95
7.90	1.1311	-0.1900	0.9370	0.5241	0.5921	0.9298	-0.0494	0.9311	356.96
7.95	1.1304	-0.1884	0.9373	0.5201	0.5945	0.9294	-0.0491	0.9307	356.97
8.00	1.1297	-0.1869	0.9377	0.5162	0.5968	0.9290	-0.0489	0.9303	356.99
8.05	1.1290	-0.1854	0.9380	0.5123	0.5991	0.9286	-0.0487	0.9299	357.00
8.10	1.1283	-0.1839	0.9383	0.5085	0.6014	0.9282	-0.0484	0.9295	357.01
8.15	1.1277	-0.1824	0.9387	0.5048	0.6036	0.9278	-0.0482	0.9291	357.03
8.20	1.1270	-0.1809	0.9390	0.5011	0.6059	0.9275	-0.0480	0.9287	357.04
8.25	1.1263	-0.1795	0.9393	0.4975	0.6081	0.9271	-0.0477	0.9283	357.05
8.30	1.1257	-0.1781	0.9396	0.4939	0.6103	0.9267	-0.0475	0.9279	357.06
8.35	1.1250	-0.1767	0.9399	0.4904	0.6124	0.9264	-0.0473	0.9276	357.08
8.40	1.1244	-0.1753	0.9402	0.4869	0.6145	0.9260	-0.0471	0.9272	357.09
8.45	1.1237	-0.1739	0.9405	0.4834	0.6167	0.9257	-0.0469	0.9268	357.10
8.50	1.1231	-0.1726	0.9409	0.4800	0.6188	0.9253	-0.0467	0.9265	357.11
8.55	1.1225	-0.1713	0.9412	0.4767	0.6208	0.9250	-0.0464	0.9261	357.13
8.60	1.1218	-0.1700	0.9415	0.4734	0.6229	0.9246	-0.0462	0.9258	357.14
8.65	1.1212	-0.1687	0.9418	0.4701	0.6249	0.9243	-0.0460	0.9254	357.15
8.70	1.1206	-0.1675	0.9420	0.4669	0.6269	0.9240	-0.0458	0.9251	357.16
8.75	1.1200	-0.1662	0.9423	0.4638	0.6289	0.9236	-0.0456	0.9248	357.17
8.80	1.1194	-0.1650	0.9426	0.4606	0.6309	0.9233	-0.0454	0.9244	357.19
8.85	1.1188	-0.1638	0.9429	0.4576	0.6328	0.9230	-0.0452	0.9241	357.20
8.90	1.1182	-0.1626	0.9432	0.4545	0.6348	0.9227	-0.0450	0.9238	357.21
8.95	1.1176	-0.1615	0.9435	0.4515	0.6367	0.9224	-0.0448	0.9234	357.22
9.00	1.1171	-0.1603	0.9437	0.4486	0.6385	0.9221	-0.0446	0.9231	357.23
9.05	1.1165	-0.1592	0.9440	0.4456	0.6404	0.9217	-0.0444	0.9228	357.24
9.10	1.1159	-0.1581	0.9443	0.4427	0.6423	0.9214	-0.0442	0.9225	357.25
9.15	1.1154	-0.1569	0.9446	0.4399	0.6441	0.9211	-0.0440	0.9222	357.27
9.20	1.1148	-0.1559	0.9448	0.4371	0.6459	0.9209	-0.0438	0.9219	357.28
9.25	1.1143	-0.1548	0.9451	0.4343	0.6477	0.9206	-0.0436	0.9216	357.29
9.30	1.1137	-0.1537	0.9453	0.4315	0.6495	0.9203	-0.0434	0.9213	357.30
9.35	1.1132	-0.1527	0.9456	0.4288	0.6513	0.9200	-0.0432	0.9210	357.31
9.40	1.1126	-0.1516	0.9459	0.4262	0.6530	0.9197	-0.0430	0.9207	357.32
9.45	1.1121	-0.1506	0.9461	0.4235	0.6547	0.9194	-0.0429	0.9204	357.33
9.50	1.1116	-0.1496	0.9464	0.4209	0.6565	0.9192	-0.0427	0.9201	357.34
9.55	1.1110	-0.1486	0.9466	0.4183	0.6582	0.9189	-0.0425	0.9199	357.35
9.60	1.1105	-0.1476	0.9469	0.4158	0.6598	0.9186	-0.0423	0.9196	357.36
9.65	1.1100	-0.1466	0.9471	0.4132	0.6615	0.9183	-0.0421	0.9193	357.37
9.70	1.1095	-0.1457	0.9473	0.4108	0.6631	0.9181	-0.0419	0.9190	357.38
9.75	1.1090	-0.1447	0.9476	0.4083	0.6648	0.9178	-0.0418	0.9188	357.39
9.80	1.1085	-0.1438	0.9478	0.4059	0.6664	0.9176	-0.0416	0.9185	357.40
9.85	1.1080	-0.1429	0.9480	0.4035	0.6680	0.9173	-0.0414	0.9182	357.41
9.90	1.1075	-0.1420	0.9483	0.4011	0.6696	0.9171	-0.0412	0.9180	357.42
9.95	1.1070	-0.1411	0.9485	0.3987	0.6712	0.9168	-0.0411	0.9177	357.43
10.00	1.1066	-0.1402	0.9487	0.3964	0.6727	0.9166	-0.0409	0.9175	357.44

$k = 0.1$ $\sigma = 0.25$

a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.0620	0.0539	0.0821	41.03	0.8196	0.1808	0.8393	12.44
7.05	0.0625	0.0537	0.0824	40.65	0.8210	0.1795	0.8404	12.34
7.10	0.0630	0.0534	0.0826	40.28	0.8223	0.1783	0.8414	12.23
7.15	0.0635	0.0531	0.0828	39.92	0.8236	0.1770	0.8424	12.13
7.20	0.0640	0.0529	0.0830	39.56	0.8249	0.1758	0.8434	12.03
7.25	0.0645	0.0526	0.0832	39.20	0.8262	0.1746	0.8444	11.93
7.30	0.0650	0.0523	0.0834	38.86	0.8275	0.1734	0.8454	11.83
7.35	0.0654	0.0521	0.0836	38.52	0.8287	0.1722	0.8464	11.74
7.40	0.0659	0.0518	0.0838	38.18	0.8299	0.1710	0.8473	11.64
7.45	0.0664	0.0516	0.0840	37.85	0.8311	0.1698	0.8483	11.55
7.50	0.0668	0.0513	0.0842	37.53	0.8323	0.1687	0.8492	11.46
7.55	0.0673	0.0511	0.0844	37.21	0.8335	0.1676	0.8501	11.37
7.60	0.0677	0.0508	0.0846	36.89	0.8346	0.1665	0.8510	11.28
7.65	0.0681	0.0506	0.0848	36.58	0.8357	0.1654	0.8519	11.19
7.70	0.0686	0.0503	0.0850	36.28	0.8369	0.1643	0.8528	11.11
7.75	0.0690	0.0501	0.0852	35.98	0.8380	0.1632	0.8537	11.02
7.80	0.0694	0.0498	0.0854	35.68	0.8391	0.1622	0.8546	10.94
7.85	0.0698	0.0496	0.0856	35.39	0.8401	0.1611	0.8554	10.86
7.90	0.0702	0.0494	0.0858	35.10	0.8412	0.1601	0.8563	10.78
7.95	0.0706	0.0491	0.0860	34.82	0.8422	0.1591	0.8571	10.70
8.00	0.0710	0.0489	0.0862	34.55	0.8433	0.1581	0.8579	10.62
8.05	0.0714	0.0487	0.0864	34.27	0.8443	0.1571	0.8588	10.54
8.10	0.0718	0.0484	0.0866	34.00	0.8453	0.1561	0.8596	10.46
8.15	0.0722	0.0482	0.0868	33.74	0.8463	0.1551	0.8604	10.39
8.20	0.0725	0.0480	0.0870	33.48	0.8472	0.1542	0.8611	10.31
8.25	0.0729	0.0477	0.0872	33.22	0.8482	0.1532	0.8619	10.24
8.30	0.0733	0.0475	0.0873	32.96	0.8492	0.1523	0.8627	10.17
8.35	0.0736	0.0473	0.0875	32.71	0.8501	0.1514	0.8635	10.10
8.40	0.0740	0.0471	0.0877	32.47	0.8510	0.1505	0.8642	10.03
8.45	0.0743	0.0469	0.0879	32.23	0.8519	0.1496	0.8650	9.96
8.50	0.0747	0.0467	0.0881	31.99	0.8528	0.1487	0.8657	9.89
8.55	0.0750	0.0464	0.0882	31.75	0.8537	0.1478	0.8664	9.82
8.60	0.0754	0.0462	0.0884	31.52	0.8546	0.1469	0.8671	9.75
8.65	0.0757	0.0460	0.0886	31.29	0.8555	0.1461	0.8679	9.69
8.70	0.0760	0.0458	0.0888	31.06	0.8563	0.1452	0.8686	9.62
8.75	0.0764	0.0456	0.0889	30.84	0.8572	0.1444	0.8693	9.56
8.80	0.0767	0.0454	0.0891	30.62	0.8580	0.1435	0.8700	9.50
8.85	0.0770	0.0452	0.0893	30.40	0.8589	0.1427	0.8706	9.43
8.90	0.0773	0.0450	0.0895	30.19	0.8597	0.1419	0.8713	9.37
8.95	0.0776	0.0448	0.0896	29.98	0.8605	0.1411	0.8720	9.31
9.00	0.0779	0.0446	0.0898	29.77	0.8613	0.1403	0.8726	9.25
9.05	0.0783	0.0444	0.0900	29.56	0.8621	0.1395	0.8733	9.19
9.10	0.0786	0.0442	0.0901	29.36	0.8629	0.1387	0.8740	9.13
9.15	0.0789	0.0440	0.0903	29.16	0.8636	0.1380	0.8746	9.08
9.20	0.0791	0.0438	0.0905	28.96	0.8644	0.1372	0.8752	9.02
9.25	0.0794	0.0436	0.0906	28.77	0.8652	0.1365	0.8759	8.96
9.30	0.0797	0.0434	0.0908	28.57	0.8659	0.1357	0.8765	8.91
9.35	0.0800	0.0432	0.0909	28.38	0.8667	0.1350	0.8771	8.85
9.40	0.0803	0.0430	0.0911	28.19	0.8674	0.1343	0.8777	8.80
9.45	0.0806	0.0429	0.0913	28.01	0.8681	0.1335	0.8783	8.74
9.50	0.0808	0.0427	0.0914	27.83	0.8688	0.1328	0.8789	8.69
9.55	0.0811	0.0425	0.0916	27.65	0.8695	0.1321	0.8795	8.64
9.60	0.0814	0.0423	0.0917	27.47	0.8702	0.1314	0.8801	8.59
9.65	0.0817	0.0421	0.0919	27.29	0.8709	0.1307	0.8807	8.54
9.70	0.0819	0.0419	0.0920	27.12	0.8716	0.1300	0.8813	8.49
9.75	0.0822	0.0418	0.0922	26.95	0.8723	0.1294	0.8818	8.44
9.80	0.0824	0.0416	0.0923	26.78	0.8730	0.1287	0.8824	8.39
9.85	0.0827	0.0414	0.0925	26.61	0.8736	0.1280	0.8829	8.34
9.90	0.0829	0.0412	0.0926	26.44	0.8743	0.1274	0.8835	8.29
9.95	0.0832	0.0411	0.0928	26.28	0.8749	0.1267	0.8840	8.24
10.00	0.0834	0.0409	0.0929	26.12	0.8756	0.1261	0.8846	8.19

$k = 0.1$ $\sigma = 0.50$									
a	$\frac{1-\sigma^2}{2} \cdot X$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.0035	-5.9742	0.5322	5.3158	0.0049	1.0049	-0.0014	1.0049	359.92
1.05	1.0042	-5.4139	0.5543	5.2249	0.0054	1.0059	-0.0019	1.0059	359.89
1.10	1.0051	-4.9277	0.5757	5.1310	0.0059	1.0071	-0.0025	1.0071	359.86
1.15	1.0061	-4.5031	0.5965	5.0343	0.0065	1.0083	-0.0033	1.0083	359.81
1.20	1.0072	-4.1300	0.6167	4.9350	0.0072	1.0097	-0.0042	1.0097	359.76
1.25	1.0085	-3.8004	0.6363	4.8334	0.0080	1.0111	-0.0053	1.0112	359.70
1.30	1.0099	-3.5077	0.6551	4.7294	0.0088	1.0127	-0.0066	1.0128	359.63
1.35	1.0115	-3.2465	0.6733	4.6235	0.0098	1.0144	-0.0082	1.0144	359.54
1.40	1.0133	-3.0124	0.6908	4.5156	0.0109	1.0162	-0.0101	1.0162	359.43
1.45	1.0153	-2.8018	0.7075	4.4062	0.0122	1.0180	-0.0122	1.0181	359.31
1.50	1.0175	-2.6116	0.7236	4.2953	0.0136	1.0198	-0.0147	1.0199	359.17
1.55	1.0199	-2.4391	0.7389	4.1831	0.0153	1.0216	-0.0176	1.0218	359.01
1.60	1.0225	-2.2823	0.7534	4.0700	0.0171	1.0234	-0.0208	1.0236	358.83
1.65	1.0254	-2.1393	0.7672	3.9561	0.0191	1.0250	-0.0245	1.0253	358.63
1.70	1.0285	-2.0085	0.7803	3.8417	0.0215	1.0265	-0.0285	1.0269	358.41
1.75	1.0318	-1.8886	0.7926	3.7270	0.0241	1.0277	-0.0329	1.0283	358.17
1.80	1.0354	-1.7785	0.8041	3.6124	0.0270	1.0287	-0.0376	1.0294	357.90
1.85	1.0393	-1.6771	0.8148	3.4982	0.0303	1.0293	-0.0428	1.0302	357.62
1.90	1.0433	-1.5835	0.8248	3.3846	0.0339	1.0295	-0.0482	1.0306	357.32
1.95	1.0476	-1.4971	0.8341	3.2721	0.0379	1.0292	-0.0539	1.0307	357.00
2.00	1.0521	-1.4172	0.8426	3.1609	0.0424	1.0285	-0.0598	1.0302	356.67
2.05	1.0567	-1.3432	0.8504	3.0515	0.0473	1.0271	-0.0658	1.0292	356.34
2.10	1.0615	-1.2746	0.8575	2.9441	0.0527	1.0252	-0.0718	1.0277	355.99
2.15	1.0664	-1.2109	0.8639	2.8391	0.0585	1.0228	-0.0778	1.0257	355.65
2.20	1.0713	-1.1518	0.8697	2.7368	0.0648	1.0197	-0.0837	1.0232	355.31
2.25	1.0763	-1.0969	0.8749	2.6375	0.0715	1.0162	-0.0893	1.0201	354.98
2.30	1.0813	-1.0458	0.8795	2.5414	0.0788	1.0121	-0.0947	1.0165	354.65
2.35	1.0862	-0.9983	0.8836	2.4487	0.0864	1.0076	-0.0997	1.0126	354.35
2.40	1.0911	-0.9540	0.8873	2.3597	0.0945	1.0027	-0.1043	1.0082	354.06
2.45	1.0958	-0.9128	0.8905	2.2742	0.1029	0.9976	-0.1085	1.0035	353.79
2.50	1.1004	-0.8744	0.8934	2.1925	0.1116	0.9922	-0.1123	0.9985	353.54
2.55	1.1048	-0.8386	0.8959	2.1145	0.1207	0.9866	-0.1155	0.9933	353.32
2.60	1.1090	-0.8051	0.8981	2.0402	0.1300	0.9809	-0.1184	0.9880	353.12
2.65	1.1130	-0.7737	0.9001	1.9694	0.1395	0.9752	-0.1207	0.9826	352.94
2.70	1.1168	-0.7444	0.9019	1.9022	0.1492	0.9695	-0.1227	0.9772	352.79
2.75	1.1204	-0.7170	0.9034	1.8384	0.1591	0.9638	-0.1242	0.9718	352.66
2.80	1.1237	-0.6912	0.9048	1.7778	0.1690	0.9583	-0.1254	0.9665	352.54
2.85	1.1268	-0.6671	0.9060	1.7203	0.1790	0.9528	-0.1263	0.9612	352.45
2.90	1.1298	-0.6443	0.9072	1.6658	0.1890	0.9476	-0.1268	0.9560	352.38
2.95	1.1325	-0.6230	0.9082	1.6141	0.1991	0.9424	-0.1271	0.9509	352.32
3.00	1.1349	-0.6028	0.9091	1.5651	0.2091	0.9375	-0.1271	0.9460	352.28
3.05	1.1372	-0.5838	0.9099	1.5186	0.2190	0.9327	-0.1270	0.9413	352.25
3.10	1.1393	-0.5659	0.9107	1.4744	0.2289	0.9281	-0.1266	0.9367	352.23
3.15	1.1412	-0.5489	0.9114	1.4325	0.2387	0.9237	-0.1261	0.9322	352.23
3.20	1.1430	-0.5329	0.9121	1.3927	0.2484	0.9194	-0.1254	0.9280	352.23
3.25	1.1445	-0.5177	0.9127	1.3549	0.2580	0.9154	-0.1247	0.9239	352.24
3.30	1.1460	-0.5033	0.9133	1.3189	0.2674	0.9115	-0.1238	0.9199	352.26
3.35	1.1472	-0.4896	0.9139	1.2847	0.2767	0.9078	-0.1229	0.9161	352.29
3.40	1.1483	-0.4766	0.9145	1.2522	0.2859	0.9043	-0.1219	0.9125	352.32
3.45	1.1493	-0.4643	0.9150	1.2211	0.2949	0.9009	-0.1209	0.9090	352.36
3.50	1.1502	-0.4525	0.9155	1.1915	0.3038	0.8977	-0.1198	0.9057	352.40
3.55	1.1509	-0.4413	0.9160	1.1633	0.3124	0.8946	-0.1186	0.9025	352.45
3.60	1.1516	-0.4306	0.9165	1.1364	0.3210	0.8917	-0.1175	0.8994	352.49
3.65	1.1521	-0.4205	0.9170	1.1107	0.3293	0.8889	-0.1163	0.8964	352.54
3.70	1.1525	-0.4107	0.9175	1.0861	0.3375	0.8862	-0.1152	0.8936	352.59
3.75	1.1529	-0.4014	0.9179	1.0626	0.3456	0.8836	-0.1140	0.8909	352.65
3.80	1.1531	-0.3925	0.9184	1.0401	0.3534	0.8811	-0.1128	0.8883	352.70
3.85	1.1533	-0.3840	0.9189	1.0186	0.3611	0.8787	-0.1117	0.8858	352.76
3.90	1.1534	-0.3758	0.9193	0.9979	0.3687	0.8765	-0.1105	0.8834	352.81
3.95	1.1534	-0.3680	0.9198	0.9781	0.3760	0.8743	-0.1094	0.8811	352.87

k = 0.1					σ = 0.50			
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0049	0.0014	0.0051	163.75	0.0156	0.1235	0.1245	82.82
1.05	-0.0059	0.0019	0.0062	162.08	0.0189	0.1358	0.1372	82.08
1.10	-0.0071	0.0025	0.0075	160.33	0.0228	0.1486	0.1504	81.30
1.15	-0.0083	0.0033	0.0089	158.49	0.0271	0.1619	0.1642	80.48
1.20	-0.0097	0.0042	0.0105	156.58	0.0321	0.1756	0.1785	79.63
1.25	-0.0111	0.0053	0.0123	154.58	0.0378	0.1897	0.1934	78.73
1.30	-0.0127	0.0066	0.0144	152.50	0.0441	0.2041	0.2088	77.80
1.35	-0.0144	0.0082	0.0166	150.33	0.0512	0.2188	0.2247	76.83
1.40	-0.0162	0.0101	0.0191	148.09	0.0591	0.2337	0.2411	75.82
1.45	-0.0180	0.0122	0.0218	145.76	0.0678	0.2489	0.2579	74.77
1.50	-0.0198	0.0147	0.0247	143.35	0.0773	0.2641	0.2752	73.68
1.55	-0.0216	0.0176	0.0279	140.87	0.0878	0.2793	0.2928	72.55
1.60	-0.0234	0.0208	0.0313	138.30	0.0992	0.2945	0.3108	71.38
1.65	-0.0250	0.0245	0.0350	135.66	0.1116	0.3095	0.3291	70.17
1.70	-0.0265	0.0285	0.0389	132.95	0.1250	0.3243	0.3476	68.92
1.75	-0.0277	0.0329	0.0430	130.17	0.1393	0.3387	0.3662	67.64
1.80	-0.0287	0.0376	0.0473	127.33	0.1547	0.3526	0.3850	66.32
1.85	-0.0293	0.0428	0.0519	124.43	0.1709	0.3659	0.4038	64.96
1.90	-0.0295	0.0482	0.0565	121.48	0.1881	0.3785	0.4226	63.57
1.95	-0.0292	0.0539	0.0613	118.48	0.2061	0.3902	0.4413	62.16
2.00	-0.0285	0.0598	0.0662	115.46	0.2248	0.4010	0.4597	60.72
2.05	-0.0271	0.0658	0.0712	112.41	0.2442	0.4107	0.4778	59.26
2.10	-0.0252	0.0718	0.0761	109.36	0.2641	0.4193	0.4955	57.79
2.15	-0.0228	0.0778	0.0811	106.30	0.2844	0.4267	0.5128	56.31
2.20	-0.0197	0.0837	0.0860	103.26	0.3050	0.4328	0.5295	54.83
2.25	-0.0162	0.0893	0.0908	100.25	0.3257	0.4377	0.5456	53.35
2.30	-0.0121	0.0947	0.0955	97.28	0.3463	0.4413	0.5610	51.88
2.35	-0.0076	0.0997	0.1000	94.36	0.3667	0.4437	0.5757	50.43
2.40	-0.0027	0.1043	0.1044	91.50	0.3868	0.4450	0.5896	49.00
2.45	0.0024	0.1085	0.1086	88.72	0.4065	0.4451	0.6028	47.60
2.50	0.0078	0.1123	0.1125	86.00	0.4256	0.4443	0.6152	46.23
2.55	0.0134	0.1155	0.1163	83.38	0.4441	0.4425	0.6269	44.89
2.60	0.0191	0.1184	0.1199	80.84	0.4620	0.4399	0.6379	43.60
2.65	0.0248	0.1207	0.1232	78.39	0.4791	0.4366	0.6482	42.34
2.70	0.0305	0.1227	0.1264	76.03	0.4955	0.4326	0.6578	41.13
2.75	0.0362	0.1242	0.1294	73.77	0.5111	0.4282	0.6667	39.95
2.80	0.0417	0.1254	0.1322	71.60	0.5259	0.4233	0.6751	38.83
2.85	0.0472	0.1263	0.1348	69.52	0.5400	0.4180	0.6829	37.74
2.90	0.0524	0.1268	0.1372	67.53	0.5534	0.4125	0.6902	36.70
2.95	0.0576	0.1271	0.1395	65.62	0.5660	0.4068	0.6970	35.70
3.00	0.0625	0.1271	0.1417	63.80	0.5780	0.4009	0.7034	34.75
3.05	0.0673	0.1270	0.1437	62.06	0.5893	0.3949	0.7093	33.83
3.10	0.0719	0.1266	0.1456	60.40	0.5999	0.3889	0.7149	32.95
3.15	0.0763	0.1261	0.1474	58.81	0.6100	0.3828	0.7202	32.11
3.20	0.0806	0.1254	0.1491	57.30	0.6196	0.3768	0.7251	31.30
3.25	0.0846	0.1247	0.1507	55.85	0.6286	0.3707	0.7298	30.53
3.30	0.0885	0.1238	0.1522	54.46	0.6371	0.3648	0.7342	29.79
3.35	0.0922	0.1229	0.1536	53.14	0.6452	0.3589	0.7383	29.09
3.40	0.0957	0.1219	0.1550	51.87	0.6528	0.3532	0.7422	28.41
3.45	0.0991	0.1209	0.1563	50.66	0.6601	0.3475	0.7460	27.76
3.50	0.1023	0.1198	0.1575	49.50	0.6670	0.3419	0.7495	27.14
3.55	0.1054	0.1186	0.1587	48.39	0.6735	0.3365	0.7529	26.55
3.60	0.1083	0.1175	0.1598	47.33	0.6797	0.3312	0.7561	25.98
3.65	0.1111	0.1163	0.1609	46.31	0.6856	0.3260	0.7592	25.43
3.70	0.1138	0.1152	0.1619	45.34	0.6912	0.3210	0.7621	24.91
3.75	0.1164	0.1140	0.1629	44.40	0.6966	0.3160	0.7650	24.40
3.80	0.1189	0.1128	0.1639	43.51	0.7018	0.3113	0.7677	23.92
3.85	0.1213	0.1117	0.1648	42.65	0.7067	0.3066	0.7703	23.45
3.90	0.1235	0.1105	0.1658	41.82	0.7114	0.3021	0.7729	23.01
3.95	0.1257	0.1094	0.1666	41.02	0.7159	0.2977	0.7753	22.58

a	$\frac{1-\sigma^2}{2} \cdot x \cdot$ REAL	IMAG.	$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$\epsilon^{-2\pi \frac{Y}{X}}$	$-\eta$ REAL	IMAG.	MODULUS	PHASE (DEGREES)
			$k = 0.1$		$\sigma = 0.50$				
4.00	1.1534	-0.3605	0.9202	0.9591	0.3833	0.8722	-0.1082	0.8789	352.93
4.05	1.1533	-0.3533	0.9207	0.9408	0.3903	0.8702	-0.1071	0.8767	352.98
4.10	1.1531	-0.3464	0.9211	0.9232	0.3972	0.8682	-0.1060	0.8747	353.04
4.15	1.1529	-0.3397	0.9216	0.9064	0.4040	0.8663	-0.1049	0.8727	353.09
4.20	1.1526	-0.3333	0.9220	0.8901	0.4106	0.8645	-0.1039	0.8707	353.15
4.25	1.1523	-0.3271	0.9225	0.8745	0.4171	0.8628	-0.1028	0.8689	353.20
4.30	1.1520	-0.3211	0.9230	0.8594	0.4234	0.8611	-0.1018	0.8671	353.26
4.35	1.1516	-0.3154	0.9234	0.8448	0.4296	0.8595	-0.1008	0.8653	353.31
4.40	1.1511	-0.3098	0.9239	0.8308	0.4357	0.8579	-0.0998	0.8637	353.37
4.45	1.1507	-0.3045	0.9243	0.8172	0.4417	0.8563	-0.0988	0.8620	353.42
4.50	1.1502	-0.2993	0.9248	0.8041	0.4475	0.8549	-0.0978	0.8604	353.47
4.55	1.1496	-0.2943	0.9252	0.7914	0.4532	0.8534	-0.0969	0.8589	353.52
4.60	1.1491	-0.2895	0.9257	0.7792	0.4588	0.8520	-0.0960	0.8574	353.57
4.65	1.1485	-0.2848	0.9261	0.7673	0.4643	0.8506	-0.0951	0.8559	353.62
4.70	1.1479	-0.2802	0.9266	0.7558	0.4696	0.8493	-0.0942	0.8545	353.67
4.75	1.1473	-0.2758	0.9270	0.7447	0.4749	0.8480	-0.0933	0.8532	353.72
4.80	1.1467	-0.2716	0.9275	0.7339	0.4801	0.8468	-0.0925	0.8518	353.77
4.85	1.1460	-0.2674	0.9279	0.7234	0.4851	0.8456	-0.0916	0.8505	353.82
4.90	1.1453	-0.2634	0.9284	0.7132	0.4901	0.8444	-0.0908	0.8492	353.86
4.95	1.1447	-0.2595	0.9288	0.7033	0.4949	0.8432	-0.0900	0.8480	353.91
5.00	1.1440	-0.2557	0.9292	0.6937	0.4997	0.8421	-0.0892	0.8468	353.95
5.05	1.1433	-0.2520	0.9297	0.6843	0.5044	0.8409	-0.0884	0.8456	354.00
5.10	1.1425	-0.2484	0.9301	0.6752	0.5090	0.8399	-0.0877	0.8444	354.04
5.15	1.1418	-0.2450	0.9306	0.6664	0.5136	0.8388	-0.0869	0.8433	354.08
5.20	1.1411	-0.2416	0.9310	0.6578	0.5180	0.8378	-0.0862	0.8422	354.13
5.25	1.1404	-0.2383	0.9314	0.6494	0.5224	0.8368	-0.0855	0.8411	354.17
5.30	1.1396	-0.2350	0.9319	0.6412	0.5267	0.8358	-0.0847	0.8400	354.21
5.35	1.1389	-0.2319	0.9323	0.6332	0.5309	0.8348	-0.0840	0.8390	354.25
5.40	1.1381	-0.2288	0.9327	0.6254	0.5350	0.8338	-0.0834	0.8380	354.29
5.45	1.1374	-0.2259	0.9331	0.6178	0.5391	0.8329	-0.0827	0.8370	354.33
5.50	1.1366	-0.2229	0.9335	0.6104	0.5431	0.8320	-0.0820	0.8360	354.37
5.55	1.1359	-0.2201	0.9339	0.6032	0.5471	0.8311	-0.0814	0.8351	354.41
5.60	1.1351	-0.2173	0.9344	0.5961	0.5510	0.8302	-0.0807	0.8341	354.45
5.65	1.1344	-0.2146	0.9348	0.5892	0.5548	0.8294	-0.0801	0.8332	354.48
5.70	1.1337	-0.2120	0.9352	0.5824	0.5585	0.8285	-0.0795	0.8323	354.52
5.75	1.1329	-0.2094	0.9356	0.5758	0.5623	0.8277	-0.0788	0.8314	354.56
5.80	1.1322	-0.2069	0.9359	0.5693	0.5659	0.8269	-0.0782	0.8306	354.60
5.85	1.1314	-0.2044	0.9363	0.5630	0.5695	0.8261	-0.0776	0.8297	354.63
5.90	1.1307	-0.2020	0.9367	0.5568	0.5730	0.8253	-0.0770	0.8289	354.67
5.95	1.1300	-0.1996	0.9371	0.5508	0.5765	0.8245	-0.0765	0.8281	354.70
6.00	1.1293	-0.1973	0.9375	0.5448	0.5799	0.8238	-0.0759	0.8273	354.74
6.05	1.1285	-0.1951	0.9379	0.5390	0.5833	0.8230	-0.0753	0.8265	354.77
6.10	1.1278	-0.1929	0.9382	0.5333	0.5866	0.8223	-0.0748	0.8257	354.80
6.15	1.1271	-0.1907	0.9386	0.5278	0.5899	0.8216	-0.0742	0.8249	354.84
6.20	1.1264	-0.1886	0.9390	0.5223	0.5931	0.8209	-0.0737	0.8242	354.87
6.25	1.1257	-0.1865	0.9393	0.5170	0.5963	0.8202	-0.0731	0.8234	354.90
6.30	1.1250	-0.1845	0.9397	0.5117	0.5995	0.8195	-0.0726	0.8227	354.94
6.35	1.1243	-0.1825	0.9400	0.5066	0.6026	0.8188	-0.0721	0.8220	354.97
6.40	1.1236	-0.1805	0.9404	0.5015	0.6056	0.8182	-0.0716	0.8213	355.00
6.45	1.1229	-0.1786	0.9407	0.4966	0.6086	0.8175	-0.0711	0.8206	355.03
6.50	1.1223	-0.1767	0.9411	0.4917	0.6116	0.8169	-0.0706	0.8199	355.06
6.55	1.1216	-0.1749	0.9414	0.4869	0.6145	0.8163	-0.0701	0.8193	355.09
6.60	1.1209	-0.1731	0.9417	0.4823	0.6174	0.8157	-0.0696	0.8186	355.12
6.65	1.1203	-0.1713	0.9421	0.4777	0.6202	0.8151	-0.0691	0.8180	355.15
6.70	1.1196	-0.1696	0.9424	0.4732	0.6230	0.8145	-0.0686	0.8173	355.18
6.75	1.1190	-0.1679	0.9427	0.4687	0.6258	0.8139	-0.0682	0.8167	355.21
6.80	1.1183	-0.1662	0.9430	0.4644	0.6285	0.8133	-0.0677	0.8161	355.24
6.85	1.1177	-0.1646	0.9433	0.4601	0.6312	0.8127	-0.0673	0.8155	355.27
6.90	1.1171	-0.1630	0.9437	0.4559	0.6339	0.8122	-0.0668	0.8149	355.30
6.95	1.1164	-0.1614	0.9440	0.4518	0.6365	0.8116	-0.0664	0.8143	355.33

$k = 0.1$ $\sigma = 0.50$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.1278	0.1082	0.1675	40.26	0.7202	0.2934	0.7777	22.17
4.05	0.1298	0.1071	0.1683	39.52	0.7244	0.2892	0.7800	21.77
4.10	0.1318	0.1060	0.1691	38.81	0.7284	0.2852	0.7822	21.38
4.15	0.1337	0.1049	0.1699	38.13	0.7322	0.2813	0.7844	21.01
4.20	0.1355	0.1039	0.1707	37.48	0.7360	0.2775	0.7865	20.66
4.25	0.1372	0.1028	0.1715	36.84	0.7396	0.2738	0.7886	20.31
4.30	0.1389	0.1018	0.1722	36.23	0.7430	0.2702	0.7906	19.98
4.35	0.1405	0.1008	0.1729	35.64	0.7464	0.2667	0.7926	19.66
4.40	0.1421	0.0998	0.1736	35.07	0.7496	0.2633	0.7945	19.35
4.45	0.1437	0.0988	0.1743	34.51	0.7528	0.2600	0.7964	19.05
4.50	0.1451	0.0978	0.1750	33.98	0.7559	0.2568	0.7983	18.76
4.55	0.1466	0.0969	0.1757	33.46	0.7588	0.2536	0.8001	18.48
4.60	0.1480	0.0960	0.1764	32.96	0.7617	0.2506	0.8019	18.21
4.65	0.1494	0.0951	0.1770	32.48	0.7645	0.2476	0.8036	17.94
4.70	0.1507	0.0942	0.1777	32.01	0.7673	0.2447	0.8054	17.69
4.75	0.1520	0.0933	0.1783	31.55	0.7700	0.2419	0.8071	17.44
4.80	0.1532	0.0925	0.1790	31.11	0.7726	0.2391	0.8087	17.20
4.85	0.1544	0.0916	0.1796	30.68	0.7751	0.2364	0.8104	16.96
4.90	0.1556	0.0908	0.1802	30.26	0.7776	0.2338	0.8120	16.74
4.95	0.1568	0.0900	0.1808	29.85	0.7800	0.2313	0.8136	16.52
5.00	0.1579	0.0892	0.1814	29.46	0.7824	0.2288	0.8151	16.30
5.05	0.1591	0.0884	0.1820	29.07	0.7847	0.2263	0.8167	16.09
5.10	0.1601	0.0877	0.1826	28.70	0.7869	0.2240	0.8182	15.89
5.15	0.1612	0.0869	0.1831	28.33	0.7891	0.2216	0.8197	15.69
5.20	0.1622	0.0862	0.1837	27.98	0.7913	0.2193	0.8211	15.49
5.25	0.1632	0.0855	0.1843	27.63	0.7934	0.2171	0.8226	15.30
5.30	0.1642	0.0847	0.1848	27.29	0.7955	0.2149	0.8240	15.12
5.35	0.1652	0.0840	0.1854	26.96	0.7975	0.2128	0.8254	14.94
5.40	0.1662	0.0834	0.1859	26.64	0.7995	0.2107	0.8268	14.76
5.45	0.1671	0.0827	0.1864	26.33	0.8015	0.2087	0.8282	14.59
5.50	0.1680	0.0820	0.1870	26.02	0.8034	0.2066	0.8296	14.42
5.55	0.1689	0.0814	0.1875	25.72	0.8053	0.2047	0.8309	14.26
5.60	0.1698	0.0807	0.1880	25.43	0.8071	0.2027	0.8322	14.10
5.65	0.1706	0.0801	0.1885	25.14	0.8089	0.2008	0.8335	13.94
5.70	0.1715	0.0795	0.1890	24.86	0.8107	0.1990	0.8348	13.79
5.75	0.1723	0.0788	0.1895	24.58	0.8125	0.1972	0.8360	13.64
5.80	0.1731	0.0782	0.1900	24.32	0.8142	0.1954	0.8373	13.49
5.85	0.1739	0.0776	0.1905	24.05	0.8158	0.1936	0.8385	13.35
5.90	0.1747	0.0770	0.1909	23.80	0.8175	0.1919	0.8397	13.21
5.95	0.1755	0.0765	0.1914	23.54	0.8191	0.1902	0.8409	13.07
6.00	0.1762	0.0759	0.1919	23.30	0.8207	0.1885	0.8421	12.94
6.05	0.1770	0.0753	0.1923	23.06	0.8223	0.1869	0.8432	12.80
6.10	0.1777	0.0748	0.1928	22.82	0.8238	0.1853	0.8444	12.67
6.15	0.1784	0.0742	0.1932	22.59	0.8253	0.1837	0.8455	12.55
6.20	0.1791	0.0737	0.1937	22.36	0.8268	0.1821	0.8466	12.42
6.25	0.1798	0.0731	0.1941	22.13	0.8283	0.1806	0.8477	12.30
6.30	0.1805	0.0726	0.1946	21.92	0.8297	0.1791	0.8488	12.18
6.35	0.1812	0.0721	0.1950	21.70	0.8311	0.1776	0.8499	12.06
6.40	0.1818	0.0716	0.1954	21.49	0.8325	0.1761	0.8509	11.95
6.45	0.1825	0.0711	0.1958	21.28	0.8339	0.1747	0.8520	11.83
6.50	0.1831	0.0706	0.1962	21.08	0.8352	0.1733	0.8530	11.72
6.55	0.1837	0.0701	0.1966	20.88	0.8365	0.1719	0.8540	11.61
6.60	0.1843	0.0696	0.1970	20.68	0.8378	0.1705	0.8550	11.50
6.65	0.1849	0.0691	0.1974	20.49	0.8391	0.1692	0.8560	11.40
6.70	0.1855	0.0686	0.1978	20.30	0.8404	0.1678	0.8570	11.29
6.75	0.1861	0.0682	0.1982	20.12	0.8416	0.1665	0.8579	11.19
6.80	0.1867	0.0677	0.1986	19.94	0.8428	0.1652	0.8589	11.09
6.85	0.1873	0.0673	0.1990	19.76	0.8440	0.1640	0.8598	10.99
6.90	0.1878	0.0668	0.1994	19.58	0.8452	0.1627	0.8607	10.90
6.95	0.1884	0.0664	0.1997	19.41	0.8464	0.1615	0.8617	10.80

$k = 0.1 \qquad \sigma = 0.50$

a	$\frac{1-\sigma^2}{2}\cdot X$ REAL	$\frac{1-\sigma^2}{2}\cdot X$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
7.00	1.1158	-0.1598	0.9443	0.4477	0.6391	0.8111	-0.0659	0.8138	355.35
7.05	1.1152	-0.1583	0.9446	0.4438	0.6416	0.8106	-0.0655	0.8132	355.38
7.10	1.1146	-0.1568	0.9449	0.4398	0.6441	0.8100	-0.0651	0.8126	355.41
7.15	1.1140	-0.1554	0.9452	0.4360	0.6466	0.8095	-0.0646	0.8121	355.43
7.20	1.1134	-0.1539	0.9455	0.4322	0.6491	0.8090	-0.0642	0.8116	355.46
7.25	1.1128	-0.1525	0.9457	0.4285	0.6515	0.8085	-0.0638	0.8110	355.49
7.30	1.1123	-0.1511	0.9460	0.4248	0.6539	0.8080	-0.0634	0.8105	355.51
7.35	1.1117	-0.1497	0.9463	0.4212	0.6562	0.8075	-0.0630	0.8100	355.54
7.40	1.1111	-0.1484	0.9466	0.4177	0.6586	0.8071	-0.0626	0.8095	355.56
7.45	1.1106	-0.1471	0.9469	0.4142	0.6609	0.8066	-0.0622	0.8090	355.59
7.50	1.1100	-0.1458	0.9471	0.4108	0.6631	0.8061	-0.0618	0.8085	355.62
7.55	1.1094	-0.1445	0.9474	0.4074	0.6654	0.8057	-0.0614	0.8080	355.64
7.60	1.1089	-0.1432	0.9477	0.4041	0.6676	0.8052	-0.0610	0.8075	355.66
7.65	1.1084	-0.1420	0.9479	0.4008	0.6698	0.8048	-0.0607	0.8070	355.69
7.70	1.1078	-0.1408	0.9482	0.3976	0.6719	0.8043	-0.0603	0.8066	355.71
7.75	1.1073	-0.1396	0.9484	0.3945	0.6740	0.8039	-0.0599	0.8061	355.74
7.80	1.1068	-0.1384	0.9487	0.3913	0.6761	0.8035	-0.0596	0.8057	355.76
7.85	1.1062	-0.1372	0.9490	0.3883	0.6782	0.8030	-0.0592	0.8052	355.78
7.90	1.1057	-0.1361	0.9492	0.3853	0.6803	0.8026	-0.0589	0.8048	355.81
7.95	1.1052	-0.1350	0.9495	0.3823	0.6823	0.8022	-0.0585	0.8043	355.83
8.00	1.1047	-0.1339	0.9497	0.3794	0.6843	0.8018	-0.0582	0.8039	355.85
8.05	1.1042	-0.1328	0.9499	0.3765	0.6863	0.8014	-0.0578	0.8035	355.87
8.10	1.1037	-0.1317	0.9502	0.3736	0.6882	0.8010	-0.0575	0.8031	355.90
8.15	1.1032	-0.1307	0.9504	0.3708	0.6902	0.8006	-0.0572	0.8027	355.92
8.20	1.1027	-0.1296	0.9506	0.3681	0.6921	0.8002	-0.0568	0.8023	355.94
8.25	1.1022	-0.1286	0.9509	0.3653	0.6940	0.7999	-0.0565	0.8019	355.96
8.30	1.1018	-0.1276	0.9511	0.3627	0.6958	0.7995	-0.0562	0.8015	355.98
8.35	1.1013	-0.1266	0.9513	0.3600	0.6977	0.7991	-0.0559	0.8011	356.00
8.40	1.1008	-0.1256	0.9516	0.3574	0.6995	0.7988	-0.0555	0.8007	356.02
8.45	1.1004	-0.1247	0.9518	0.3548	0.7013	0.7984	-0.0552	0.8003	356.04
8.50	1.0999	-0.1237	0.9520	0.3523	0.7031	0.7980	-0.0549	0.7999	356.06
8.55	1.0994	-0.1228	0.9522	0.3498	0.7048	0.7977	-0.0546	0.7996	356.08
8.60	1.0990	-0.1219	0.9524	0.3473	0.7066	0.7973	-0.0543	0.7992	356.10
8.65	1.0985	-0.1210	0.9527	0.3449	0.7083	0.7970	-0.0540	0.7988	356.12
8.70	1.0981	-0.1201	0.9529	0.3425	0.7100	0.7967	-0.0537	0.7985	356.14
8.75	1.0977	-0.1192	0.9531	0.3402	0.7117	0.7963	-0.0534	0.7981	356.16
8.80	1.0972	-0.1183	0.9533	0.3378	0.7133	0.7960	-0.0531	0.7978	356.18
8.85	1.0968	-0.1175	0.9535	0.3355	0.7150	0.7957	-0.0528	0.7974	356.20
8.90	1.0964	-0.1166	0.9537	0.3333	0.7166	0.7954	-0.0526	0.7971	356.22
8.95	1.0960	-0.1158	0.9539	0.3310	0.7182	0.7950	-0.0523	0.7968	356.24
9.00	1.0955	-0.1150	0.9541	0.3288	0.7198	0.7947	-0.0520	0.7964	356.26
9.05	1.0951	-0.1142	0.9543	0.3266	0.7214	0.7944	-0.0517	0.7961	356.27
9.10	1.0947	-0.1134	0.9545	0.3245	0.7229	0.7941	-0.0515	0.7958	356.29
9.15	1.0943	-0.1126	0.9547	0.3223	0.7244	0.7938	-0.0512	0.7955	356.31
9.20	1.0939	-0.1118	0.9549	0.3202	0.7260	0.7935	-0.0509	0.7951	356.33
9.25	1.0935	-0.1110	0.9551	0.3182	0.7275	0.7932	-0.0507	0.7948	356.35
9.30	1.0931	-0.1103	0.9553	0.3161	0.7290	0.7929	-0.0504	0.7945	356.36
9.35	1.0927	-0.1095	0.9554	0.3141	0.7304	0.7926	-0.0501	0.7942	356.38
9.40	1.0923	-0.1088	0.9556	0.3121	0.7319	0.7923	-0.0499	0.7939	356.40
9.45	1.0919	-0.1081	0.9558	0.3101	0.7333	0.7921	-0.0496	0.7936	356.41
9.50	1.0916	-0.1073	0.9560	0.3082	0.7348	0.7918	-0.0494	0.7933	356.43
9.55	1.0912	-0.1066	0.9562	0.3063	0.7362	0.7915	-0.0491	0.7930	356.45
9.60	1.0908	-0.1059	0.9563	0.3044	0.7376	0.7912	-0.0489	0.7927	356.46
9.65	1.0904	-0.1052	0.9565	0.3025	0.7390	0.7909	-0.0486	0.7924	356.48
9.70	1.0901	-0.1046	0.9567	0.3007	0.7403	0.7907	-0.0484	0.7922	356.50
9.75	1.0897	-0.1039	0.9569	0.2988	0.7417	0.7904	-0.0482	0.7919	356.51
9.80	1.0893	-0.1032	0.9570	0.2970	0.7430	0.7901	-0.0479	0.7916	356.53
9.85	1.0890	-0.1026	0.9572	0.2952	0.7444	0.7899	-0.0477	0.7913	356.55
9.90	1.0886	-0.1019	0.9574	0.2935	0.7457	0.7896	-0.0475	0.7911	356.56
9.95	1.0883	-0.1013	0.9575	0.2917	0.7470	0.7894	-0.0472	0.7908	356.58
10.00	1.0879	-0.1006	0.9577	0.2900	0.7483	0.7891	-0.0470	0.7905	356.59

	$k = 0.1$				$\sigma = 0.50$			
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.1889	0.0659	0.2001	19.24	0.8475	0.1603	0.8626	10.71
7.05	0.1894	0.0655	0.2004	19.07	0.8487	0.1591	0.8634	10.62
7.10	0.1900	0.0651	0.2008	18.91	0.8498	0.1579	0.8643	10.53
7.15	0.1905	0.0646	0.2012	18.74	0.8509	0.1567	0.8652	10.44
7.20	0.1910	0.0642	0.2015	18.58	0.8520	0.1556	0.8660	10.35
7.25	0.1915	0.0638	0.2018	18.43	0.8530	0.1545	0.8669	10.26
7.30	0.1920	0.0634	0.2022	18.27	0.8541	0.1533	0.8677	10.18
7.35	0.1925	0.0630	0.2025	18.12	0.8551	0.1522	0.8685	10.10
7.40	0.1929	0.0626	0.2028	17.97	0.8561	0.1512	0.8694	10.01
7.45	0.1934	0.0622	0.2032	17.83	0.8571	0.1501	0.8702	9.93
7.50	0.1939	0.0618	0.2035	17.68	0.8581	0.1490	0.8710	9.85
7.55	0.1943	0.0614	0.2038	17.54	0.8591	0.1480	0.8717	9.77
7.60	0.1948	0.0610	0.2041	17.40	0.8600	0.1470	0.8725	9.70
7.65	0.1952	0.0607	0.2045	17.26	0.8610	0.1460	0.8733	9.62
7.70	0.1957	0.0603	0.2048	17.13	0.8619	0.1450	0.8740	9.55
7.75	0.1961	0.0599	0.2051	16.99	0.8629	0.1440	0.8748	9.47
7.80	0.1965	0.0596	0.2054	16.86	0.8638	0.1430	0.8755	9.40
7.85	0.1970	0.0592	0.2057	16.73	0.8647	0.1421	0.8763	9.33
7.90	0.1974	0.0589	0.2060	16.61	0.8655	0.1411	0.8770	9.26
7.95	0.1978	0.0585	0.2063	16.48	0.8664	0.1402	0.8777	9.19
8.00	0.1982	0.0582	0.2066	16.36	0.8673	0.1393	0.8784	9.12
8.05	0.1986	0.0578	0.2068	16.23	0.8681	0.1383	0.8791	9.05
8.10	0.1990	0.0575	0.2071	16.11	0.8690	0.1375	0.8798	8.99
8.15	0.1994	0.0572	0.2074	16.00	0.8698	0.1366	0.8805	8.92
8.20	0.1998	0.0568	0.2077	15.88	0.8706	0.1357	0.8811	8.86
8.25	0.2001	0.0565	0.2080	15.76	0.8714	0.1348	0.8818	8.80
8.30	0.2005	0.0562	0.2082	15.65	0.8722	0.1340	0.8825	8.73
8.35	0.2009	0.0559	0.2085	15.54	0.8730	0.1331	0.8831	8.67
8.40	0.2012	0.0555	0.2088	15.43	0.8738	0.1323	0.8837	8.61
8.45	0.2016	0.0552	0.2090	15.32	0.8746	0.1315	0.8844	8.55
8.50	0.2020	0.0549	0.2093	15.21	0.8753	0.1307	0.8850	8.49
8.55	0.2023	0.0546	0.2095	15.11	0.8761	0.1299	0.8856	8.43
8.60	0.2027	0.0543	0.2098	15.00	0.8768	0.1291	0.8863	8.37
8.65	0.2030	0.0540	0.2101	14.90	0.8775	0.1283	0.8869	8.32
8.70	0.2033	0.0537	0.2103	14.80	0.8783	0.1275	0.8875	8.26
8.75	0.2037	0.0534	0.2106	14.70	0.8790	0.1268	0.8881	8.21
8.80	0.2040	0.0531	0.2108	14.60	0.8797	0.1260	0.8887	8.15
8.85	0.2043	0.0528	0.2110	14.50	0.8804	0.1253	0.8892	8.10
8.90	0.2046	0.0526	0.2113	14.40	0.8811	0.1245	0.8898	8.04
8.95	0.2050	0.0523	0.2115	14.31	0.8817	0.1238	0.8904	7.99
9.00	0.2053	0.0520	0.2118	14.22	0.8824	0.1231	0.8910	7.94
9.05	0.2056	0.0517	0.2120	14.12	0.8831	0.1224	0.8915	7.89
9.10	0.2059	0.0515	0.2122	14.03	0.8837	0.1217	0.8921	7.84
9.15	0.2062	0.0512	0.2125	13.94	0.8844	0.1210	0.8926	7.79
9.20	0.2065	0.0509	0.2127	13.85	0.8850	0.1203	0.8932	7.74
9.25	0.2068	0.0507	0.2129	13.76	0.8857	0.1196	0.8937	7.69
9.30	0.2071	0.0504	0.2131	13.68	0.8863	0.1189	0.8942	7.64
9.35	0.2074	0.0501	0.2134	13.59	0.8869	0.1182	0.8948	7.59
9.40	0.2077	0.0499	0.2136	13.51	0.8875	0.1176	0.8953	7.55
9.45	0.2079	0.0496	0.2138	13.42	0.8881	0.1169	0.8958	7.50
9.50	0.2082	0.0494	0.2140	13.34	0.8887	0.1163	0.8963	7.46
9.55	0.2085	0.0491	0.2142	13.26	0.8893	0.1157	0.8968	7.41
9.60	0.2088	0.0489	0.2144	13.18	0.8899	0.1150	0.8973	7.37
9.65	0.2091	0.0486	0.2146	13.10	0.8905	0.1144	0.8978	7.32
9.70	0.2093	0.0484	0.2148	13.02	0.8911	0.1138	0.8983	7.28
9.75	0.2096	0.0482	0.2150	12.94	0.8916	0.1132	0.8988	7.23
9.80	0.2099	0.0479	0.2153	12.86	0.8922	0.1126	0.8993	7.19
9.85	0.2101	0.0477	0.2155	12.79	0.8928	0.1120	0.8998	7.15
9.90	0.2104	0.0475	0.2157	12.71	0.8933	0.1114	0.9002	7.11
9.95	0.2106	0.0472	0.2159	12.64	0.8939	0.1108	0.9007	7.07
10.00	0.2109	0.0470	0.2160	12.56	0.8944	0.1102	0.9012	7.03

$k = 0.2$ $\sigma = 0.00$										
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.2376	-9.9958	0.4205	5.5532	0.0039	1.0052	0.0241	1.0055	1.37
1.05	1.2378	-9.0657	0.4388	5.4836	0.0042	1.0063	0.0264	1.0066	1.50
1.10	1.2380	-8.2595	0.4567	5.4116	0.0045	1.0075	0.0287	1.0079	1.63
1.15	1.2383	-7.5560	0.4742	5.3373	0.0048	1.0089	0.0310	1.0094	1.76
1.20	1.2386	-6.9386	0.4913	5.2609	0.0052	1.0105	0.0334	1.0111	1.89
1.25	1.2389	-6.3937	0.5079	5.1825	0.0056	1.0123	0.0358	1.0129	2.02
1.30	1.2393	-5.9104	0.5242	5.1024	0.0061	1.0142	0.0381	1.0149	2.15
1.35	1.2397	-5.4798	0.5400	5.0205	0.0066	1.0163	0.0404	1.0171	2.28
1.40	1.2402	-5.0944	0.5554	4.9371	0.0072	1.0186	0.0427	1.0195	2.40
1.45	1.2407	-4.7482	0.5703	4.8523	0.0078	1.0212	0.0449	1.0221	2.52
1.50	1.2413	-4.4360	0.5848	4.7664	0.0085	1.0239	0.0469	1.0249	2.62
1.55	1.2419	-4.1534	0.5988	4.6794	0.0093	1.0267	0.0489	1.0279	2.72
1.60	1.2425	-3.8970	0.6124	4.5915	0.0101	1.0298	0.0507	1.0310	2.82
1.65	1.2432	-3.6634	0.6255	4.5028	0.0111	1.0330	0.0523	1.0343	2.90
1.70	1.2440	-3.4502	0.6381	4.4137	0.0121	1.0364	0.0537	1.0378	2.97
1.75	1.2448	-3.2550	0.6503	4.3241	0.0132	1.0399	0.0549	1.0413	3.02
1.80	1.2457	-3.0758	0.6620	4.2342	0.0145	1.0435	0.0559	1.0450	3.07
1.85	1.2466	-2.9110	0.6732	4.1443	0.0159	1.0472	0.0566	1.0488	3.09
1.90	1.2476	-2.7591	0.6839	4.0545	0.0173	1.0510	0.0571	1.0525	3.11
1.95	1.2487	-2.6188	0.6942	3.9650	0.0190	1.0548	0.0573	1.0564	3.11
2.00	1.2498	-2.4889	0.7041	3.8758	0.0207	1.0586	0.0572	1.0602	3.09
2.05	1.2509	-2.3684	0.7134	3.7872	0.0227	1.0625	0.0568	1.0640	3.06
2.10	1.2521	-2.2565	0.7224	3.6993	0.0247	1.0662	0.0562	1.0677	3.01
2.15	1.2533	-2.1525	0.7309	3.6123	0.0270	1.0699	0.0552	1.0713	2.96
2.20	1.2545	-2.0555	0.7390	3.5262	0.0294	1.0735	0.0540	1.0748	2.88
2.25	1.2558	-1.9650	0.7466	3.4413	0.0320	1.0769	0.0526	1.0782	2.80
2.30	1.2571	-1.8805	0.7539	3.3576	0.0348	1.0802	0.0509	1.0814	2.70
2.35	1.2584	-1.8015	0.7607	3.2753	0.0378	1.0833	0.0490	1.0844	2.59
2.40	1.2597	-1.7274	0.7672	3.1945	0.0410	1.0862	0.0470	1.0872	2.48
2.45	1.2610	-1.6580	0.7734	3.1153	0.0444	1.0889	0.0447	1.0898	2.35
2.50	1.2623	-1.5929	0.7791	3.0377	0.0479	1.0914	0.0423	1.0922	2.22
2.55	1.2636	-1.5317	0.7846	2.9619	0.0517	1.0936	0.0398	1.0944	2.08
2.60	1.2648	-1.4741	0.7897	2.8879	0.0557	1.0956	0.0372	1.0963	1.94
2.65	1.2661	-1.4200	0.7945	2.8158	0.0599	1.0974	0.0345	1.0979	1.80
2.70	1.2672	-1.3689	0.7990	2.7457	0.0642	1.0989	0.0318	1.0994	1.66
2.75	1.2684	-1.3208	0.8033	2.6775	0.0687	1.1002	0.0290	1.1006	1.51
2.80	1.2695	-1.2755	0.8073	2.6112	0.0734	1.1013	0.0263	1.1016	1.37
2.85	1.2705	-1.2326	0.8110	2.5470	0.0783	1.1022	0.0236	1.1024	1.23
2.90	1.2714	-1.1921	0.8146	2.4848	0.0833	1.1028	0.0209	1.1030	1.09
2.95	1.2723	-1.1538	0.8179	2.4247	0.0885	1.1033	0.0183	1.1035	0.95
3.00	1.2731	-1.1175	0.8210	2.3665	0.0938	1.1036	0.0157	1.1037	0.82
3.05	1.2739	-1.0832	0.8239	2.3102	0.0992	1.1037	0.0132	1.1038	0.69
3.10	1.2745	-1.0507	0.8267	2.2560	0.1048	1.1037	0.0108	1.1038	0.56
3.15	1.2751	-1.0198	0.8293	2.2036	0.1104	1.1036	0.0085	1.1036	0.44
3.20	1.2755	-0.9905	0.8318	2.1531	0.1161	1.1033	0.0063	1.1034	0.33
3.25	1.2759	-0.9627	0.8342	2.1044	0.1219	1.1030	0.0042	1.1030	0.22
3.30	1.2762	-0.9362	0.8364	2.0575	0.1278	1.1025	0.0022	1.1025	0.11
3.35	1.2764	-0.9110	0.8385	2.0124	0.1337	1.1020	0.0003	1.1020	0.01
3.40	1.2765	-0.8871	0.8405	1.9689	0.1396	1.1014	-0.0015	1.1014	359.92
3.45	1.2765	-0.8643	0.8424	1.9270	0.1456	1.1008	-0.0033	1.1008	359.83
3.50	1.2764	-0.8425	0.8443	1.8867	0.1516	1.1000	-0.0049	1.1001	359.75
3.55	1.2762	-0.8218	0.8460	1.8479	0.1576	1.0993	-0.0064	1.0993	359.67
3.60	1.2760	-0.8020	0.8477	1.8106	0.1636	1.0985	-0.0079	1.0986	359.59
3.65	1.2757	-0.7830	0.8493	1.7746	0.1696	1.0977	-0.0092	1.0978	359.52
3.70	1.2752	-0.7650	0.8509	1.7400	0.1755	1.0969	-0.0105	1.0969	359.45
3.75	1.2747	-0.7477	0.8524	1.7066	0.1815	1.0961	-0.0117	1.0961	359.39
3.80	1.2742	-0.7311	0.8539	1.6745	0.1874	1.0952	-0.0129	1.0953	359.33
3.85	1.2735	-0.7152	0.8553	1.6436	0.1933	1.0943	-0.0139	1.0944	359.27
3.90	1.2728	-0.7000	0.8566	1.6138	0.1991	1.0935	-0.0149	1.0936	359.22
3.95	1.2720	-0.6854	0.8580	1.5851	0.2049	1.0926	-0.0159	1.0927	359.17

$k=0.2$					$\sigma=0.00$			
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0052	-0.0241	0.0247	257.81	0.0122	0.0985	0.0993	82.94
1.05	-0.0063	-0.0264	0.0271	256.57	0.0148	0.1083	0.1093	82.23
1.10	-0.0075	-0.0287	0.0297	255.28	0.0177	0.1184	0.1197	81.48
1.15	-0.0089	-0.0310	0.0323	253.93	0.0211	0.1289	0.1306	80.69
1.20	-0.0105	-0.0334	0.0350	252.53	0.0249	0.1397	0.1419	79.88
1.25	-0.0123	-0.0358	0.0378	251.07	0.0292	0.1507	0.1535	79.03
1.30	-0.0142	-0.0381	0.0407	249.57	0.0340	0.1621	0.1656	78.16
1.35	-0.0163	-0.0404	0.0436	248.01	0.0393	0.1736	0.1780	77.25
1.40	-0.0186	-0.0427	0.0466	246.40	0.0451	0.1853	0.1907	76.32
1.45	-0.0212	-0.0449	0.0496	244.75	0.0515	0.1971	0.2038	75.36
1.50	-0.0239	-0.0469	0.0526	243.05	0.0585	0.2091	0.2171	74.37
1.55	-0.0267	-0.0489	0.0557	241.31	0.0661	0.2210	0.2307	73.35
1.60	-0.0298	-0.0507	0.0588	239.54	0.0743	0.2329	0.2445	72.32
1.65	-0.0330	-0.0523	0.0618	237.72	0.0831	0.2448	0.2585	71.25
1.70	-0.0364	-0.0537	0.0649	235.87	0.0925	0.2565	0.2727	70.17
1.75	-0.0399	-0.0549	0.0679	234.00	0.1025	0.2680	0.2870	69.07
1.80	-0.0435	-0.0559	0.0708	232.09	0.1131	0.2793	0.3013	67.95
1.85	-0.0472	-0.0566	0.0737	230.16	0.1243	0.2903	0.3158	66.82
1.90	-0.0510	-0.0571	0.0765	228.21	0.1361	0.3009	0.3302	65.67
1.95	-0.0548	-0.0573	0.0793	226.25	0.1483	0.3111	0.3447	64.51
2.00	-0.0586	-0.0572	0.0819	224.27	0.1611	0.3209	0.3591	63.34
2.05	-0.0625	-0.0568	0.0844	222.29	0.1744	0.3301	0.3734	62.16
2.10	-0.0662	-0.0562	0.0868	220.30	0.1880	0.3388	0.3875	60.98
2.15	-0.0699	-0.0552	0.0891	218.32	0.2020	0.3470	0.4015	59.79
2.20	-0.0735	-0.0540	0.0912	216.34	0.2163	0.3545	0.4153	58.60
2.25	-0.0769	-0.0526	0.0932	214.37	0.2309	0.3613	0.4288	57.42
2.30	-0.0802	-0.0509	0.0950	212.42	0.2457	0.3675	0.4421	56.24
2.35	-0.0833	-0.0490	0.0967	210.48	0.2606	0.3731	0.4551	55.06
2.40	-0.0862	-0.0470	0.0982	208.57	0.2756	0.3779	0.4677	53.90
2.45	-0.0889	-0.0447	0.0995	206.69	0.2906	0.3821	0.4801	52.75
2.50	-0.0914	-0.0423	0.1007	204.84	0.3056	0.3856	0.4920	51.60
2.55	-0.0936	-0.0398	0.1017	203.02	0.3205	0.3885	0.5036	50.48
2.60	-0.0956	-0.0372	0.1026	201.24	0.3352	0.3907	0.5148	49.37
2.65	-0.0974	-0.0345	0.1033	199.50	0.3498	0.3923	0.5256	48.28
2.70	-0.0989	-0.0318	0.1039	197.80	0.3642	0.3934	0.5361	47.21
2.75	-0.1002	-0.0290	0.1043	196.15	0.3782	0.3939	0.5461	46.16
2.80	-0.1013	-0.0263	0.1047	194.55	0.3920	0.3939	0.5557	45.13
2.85	-0.1022	-0.0236	0.1048	192.99	0.4055	0.3934	0.5649	44.13
2.90	-0.1028	-0.0209	0.1049	191.48	0.4186	0.3924	0.5738	43.16
2.95	-0.1033	-0.0183	0.1049	190.03	0.4313	0.3911	0.5822	42.20
3.00	-0.1036	-0.0157	0.1048	188.62	0.4436	0.3894	0.5903	41.28
3.05	-0.1037	-0.0132	0.1046	187.26	0.4556	0.3874	0.5980	40.38
3.10	-0.1037	-0.0108	0.1043	185.96	0.4672	0.3851	0.6054	39.50
3.15	-0.1036	-0.0085	0.1039	184.70	0.4783	0.3826	0.6125	38.65
3.20	-0.1033	-0.0063	0.1035	183.49	0.4891	0.3798	0.6192	37.83
3.25	-0.1030	-0.0042	0.1031	182.33	0.4994	0.3768	0.6257	37.03
3.30	-0.1025	-0.0022	0.1026	181.22	0.5094	0.3737	0.6318	36.26
3.35	-0.1020	-0.0003	0.1020	180.15	0.5190	0.3705	0.6377	35.52
3.40	-0.1014	0.0015	0.1014	179.13	0.5283	0.3671	0.6433	34.80
3.45	-0.1008	0.0033	0.1008	178.14	0.5372	0.3637	0.6487	34.10
3.50	-0.1000	0.0049	0.1002	177.20	0.5457	0.3602	0.6539	33.43
3.55	-0.0993	0.0064	0.0995	176.30	0.5539	0.3567	0.6588	32.78
3.60	-0.0985	0.0079	0.0988	175.43	0.5618	0.3531	0.6635	32.15
3.65	-0.0977	0.0092	0.0982	174.60	0.5694	0.3495	0.6681	31.54
3.70	-0.0969	0.0105	0.0975	173.81	0.5767	0.3459	0.6725	30.96
3.75	-0.0961	0.0117	0.0968	173.04	0.5837	0.3423	0.6767	30.39
3.80	-0.0952	0.0129	0.0961	172.31	0.5904	0.3388	0.6807	29.85
3.85	-0.0943	0.0139	0.0954	171.61	0.5969	0.3352	0.6846	29.32
3.90	-0.0935	0.0149	0.0947	170.93	0.6032	0.3317	0.6884	28.81
3.95	-0.0926	0.0159	0.0940	170.28	0.6093	0.3283	0.6921	28.32

a	$\frac{1-\sigma^2}{2}\cdot x$ REAL	$\frac{1-\sigma^2}{2}\cdot x$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
$k = 0.2$ $\sigma = 0.00$									
4.00	1.2712	-0.6714	0.8593	1.5574	0.2107	1.0918	-0.0167	1.0919	359.12
4.05	1.2703	-0.6579	0.8605	1.5306	0.2164	1.0909	-0.0176	1.0910	359.08
4.10	1.2693	-0.6450	0.8618	1.5048	0.2221	1.0901	-0.0184	1.0902	359.04
4.15	1.2683	-0.6325	0.8630	1.4799	0.2277	1.0892	-0.0191	1.0894	359.00
4.20	1.2672	-0.6206	0.8642	1.4559	0.2332	1.0884	-0.0198	1.0886	358.96
4.25	1.2661	-0.6090	0.8653	1.4326	0.2387	1.0875	-0.0204	1.0877	358.92
4.30	1.2649	-0.5979	0.8665	1.4101	0.2441	1.0867	-0.0210	1.0869	358.89
4.35	1.2637	-0.5872	0.8676	1.3884	0.2495	1.0859	-0.0216	1.0861	358.86
4.40	1.2625	-0.5768	0.8687	1.3674	0.2548	1.0851	-0.0222	1.0853	358.83
4.45	1.2612	-0.5668	0.8698	1.3470	0.2600	1.0843	-0.0227	1.0846	358.80
4.50	1.2599	-0.5571	0.8708	1.3273	0.2652	1.0836	-0.0231	1.0838	358.78
4.55	1.2585	-0.5478	0.8719	1.3081	0.2703	1.0828	-0.0236	1.0831	358.75
4.60	1.2571	-0.5387	0.8729	1.2896	0.2754	1.0820	-0.0240	1.0823	358.73
4.65	1.2557	-0.5300	0.8739	1.2716	0.2804	1.0813	-0.0244	1.0816	358.71
4.70	1.2543	-0.5215	0.8749	1.2541	0.2853	1.0806	-0.0248	1.0809	358.68
4.75	1.2529	-0.5133	0.8759	1.2372	0.2902	1.0798	-0.0252	1.0801	358.66
4.80	1.2514	-0.5053	0.8769	1.2207	0.2950	1.0791	-0.0255	1.0794	358.65
4.85	1.2500	-0.4976	0.8778	1.2047	0.2998	1.0784	-0.0258	1.0787	358.63
4.90	1.2485	-0.4901	0.8788	1.1891	0.3045	1.0778	-0.0261	1.0781	358.61
4.95	1.2470	-0.4828	0.8797	1.1739	0.3092	1.0771	-0.0264	1.0774	358.60
5.00	1.2455	-0.4757	0.8807	1.1591	0.3138	1.0764	-0.0267	1.0767	358.58
5.05	1.2439	-0.4688	0.8816	1.1447	0.3183	1.0757	-0.0269	1.0761	358.57
5.10	1.2424	-0.4621	0.8825	1.1307	0.3228	1.0751	-0.0272	1.0754	358.55
5.15	1.2409	-0.4556	0.8834	1.1171	0.3272	1.0745	-0.0274	1.0748	358.54
5.20	1.2394	-0.4493	0.8843	1.1037	0.3316	1.0738	-0.0276	1.0742	358.53
5.25	1.2378	-0.4431	0.8852	1.0907	0.3360	1.0732	-0.0278	1.0736	358.52
5.30	1.2363	-0.4371	0.8860	1.0780	0.3403	1.0726	-0.0280	1.0730	358.50
5.35	1.2348	-0.4312	0.8869	1.0656	0.3445	1.0720	-0.0282	1.0724	358.49
5.40	1.2333	-0.4255	0.8877	1.0535	0.3487	1.0714	-0.0283	1.0718	358.48
5.45	1.2317	-0.4200	0.8886	1.0417	0.3529	1.0708	-0.0285	1.0712	358.48
5.50	1.2302	-0.4145	0.8894	1.0301	0.3570	1.0702	-0.0286	1.0706	358.47
5.55	1.2287	-0.4092	0.8902	1.0188	0.3610	1.0697	-0.0288	1.0701	358.46
5.60	1.2272	-0.4041	0.8910	1.0077	0.3650	1.0691	-0.0289	1.0695	358.45
5.65	1.2257	-0.3990	0.8918	0.9969	0.3690	1.0685	-0.0290	1.0689	358.44
5.70	1.2242	-0.3941	0.8926	0.9863	0.3730	1.0680	-0.0291	1.0684	358.44
5.75	1.2228	-0.3892	0.8934	0.9759	0.3768	1.0675	-0.0292	1.0679	358.43
5.80	1.2213	-0.3845	0.8941	0.9658	0.3807	1.0669	-0.0293	1.0673	358.42
5.85	1.2198	-0.3799	0.8949	0.9558	0.3845	1.0664	-0.0294	1.0668	358.42
5.90	1.2184	-0.3754	0.8956	0.9460	0.3883	1.0659	-0.0295	1.0663	358.41
5.95	1.2169	-0.3710	0.8964	0.9365	0.3920	1.0654	-0.0296	1.0658	358.41
6.00	1.2155	-0.3667	0.8971	0.9271	0.3957	1.0649	-0.0297	1.0653	358.40
6.05	1.2141	-0.3625	0.8978	0.9179	0.3994	1.0644	-0.0297	1.0648	358.40
6.10	1.2127	-0.3583	0.8985	0.9089	0.4030	1.0639	-0.0298	1.0643	358.40
6.15	1.2113	-0.3543	0.8992	0.9000	0.4066	1.0634	-0.0298	1.0638	358.39
6.20	1.2099	-0.3503	0.8999	0.8913	0.4101	1.0629	-0.0299	1.0633	358.39
6.25	1.2086	-0.3465	0.9006	0.8828	0.4136	1.0624	-0.0299	1.0629	358.39
6.30	1.2072	-0.3427	0.9013	0.8744	0.4171	1.0620	-0.0300	1.0624	358.38
6.35	1.2059	-0.3389	0.9020	0.8662	0.4205	1.0615	-0.0300	1.0619	358.38
6.40	1.2045	-0.3353	0.9026	0.8582	0.4239	1.0611	-0.0300	1.0615	358.38
6.45	1.2032	-0.3317	0.9033	0.8502	0.4273	1.0606	-0.0300	1.0610	358.38
6.50	1.2019	-0.3282	0.9039	0.8425	0.4306	1.0602	-0.0300	1.0606	358.38
6.55	1.2006	-0.3248	0.9045	0.8348	0.4340	1.0597	-0.0301	1.0602	358.38
6.60	1.1994	-0.3214	0.9052	0.8273	0.4372	1.0593	-0.0301	1.0597	358.37
6.65	1.1981	-0.3181	0.9058	0.8199	0.4405	1.0589	-0.0301	1.0593	358.37
6.70	1.1968	-0.3149	0.9064	0.8127	0.4437	1.0584	-0.0301	1.0589	358.37
6.75	1.1956	-0.3117	0.9070	0.8055	0.4468	1.0580	-0.0301	1.0585	358.37
6.80	1.1944	-0.3086	0.9076	0.7985	0.4500	1.0576	-0.0301	1.0581	358.37
6.85	1.1932	-0.3055	0.9082	0.7916	0.4531	1.0572	-0.0301	1.0576	358.37
6.90	1.1920	-0.3025	0.9088	0.7849	0.4562	1.0568	-0.0301	1.0572	358.37
6.95	1.1908	-0.2996	0.9093	0.7782	0.4592	1.0564	-0.0300	1.0569	358.37

$k = 0.2$ $\sigma = 0.00$

a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	-0.0918	0.0167	0.0933	169.66	0.6151	0.3249	0.6956	27.84
4.05	-0.0909	0.0176	0.0926	169.06	0.6207	0.3215	0.6990	27.38
4.10	-0.0901	0.0184	0.0919	168.48	0.6262	0.3182	0.7024	26.94
4.15	-0.0892	0.0191	0.0912	167.92	0.6314	0.3149	0.7056	26.51
4.20	-0.0884	0.0198	0.0906	167.39	0.6365	0.3117	0.7087	26.09
4.25	-0.0875	0.0204	0.0899	166.87	0.6414	0.3085	0.7118	25.69
4.30	-0.0867	0.0210	0.0892	166.37	0.6462	0.3054	0.7147	25.30
4.35	-0.0859	0.0216	0.0886	165.88	0.6508	0.3024	0.7176	24.92
4.40	-0.0851	0.0222	0.0880	165.41	0.6553	0.2994	0.7205	24.55
4.45	-0.0843	0.0227	0.0873	164.96	0.6597	0.2965	0.7232	24.20
4.50	-0.0836	0.0231	0.0867	164.52	0.6639	0.2936	0.7259	23.86
4.55	-0.0828	0.0236	0.0861	164.09	0.6680	0.2908	0.7286	23.52
4.60	-0.0820	0.0240	0.0855	163.68	0.6720	0.2880	0.7311	23.20
4.65	-0.0813	0.0244	0.0849	163.28	0.6759	0.2853	0.7337	22.88
4.70	-0.0806	0.0248	0.0843	162.89	0.6797	0.2826	0.7361	22.58
4.75	-0.0798	0.0252	0.0837	162.51	0.6834	0.2800	0.7386	22.28
4.80	-0.0791	0.0255	0.0831	162.14	0.6871	0.2774	0.7410	21.99
4.85	-0.0784	0.0258	0.0826	161.78	0.6906	0.2749	0.7433	21.71
4.90	-0.0778	0.0261	0.0820	161.43	0.6940	0.2724	0.7456	21.43
4.95	-0.0771	0.0264	0.0815	161.08	0.6974	0.2700	0.7478	21.17
5.00	-0.0764	0.0267	0.0809	160.75	0.7007	0.2676	0.7501	20.90
5.05	-0.0757	0.0269	0.0804	160.43	0.7039	0.2653	0.7522	20.65
5.10	-0.0751	0.0272	0.0799	160.11	0.7070	0.2630	0.7544	20.40
5.15	-0.0745	0.0274	0.0793	159.80	0.7101	0.2607	0.7565	20.16
5.20	-0.0738	0.0276	0.0788	159.50	0.7131	0.2585	0.7586	19.93
5.25	-0.0732	0.0278	0.0783	159.20	0.7161	0.2563	0.7606	19.70
5.30	-0.0726	0.0280	0.0778	158.91	0.7190	0.2542	0.7626	19.47
5.35	-0.0720	0.0282	0.0773	158.63	0.7218	0.2521	0.7646	19.25
5.40	-0.0714	0.0283	0.0768	158.35	0.7246	0.2500	0.7665	19.04
5.45	-0.0708	0.0285	0.0763	158.08	0.7273	0.2480	0.7684	18.83
5.50	-0.0702	0.0286	0.0759	157.81	0.7300	0.2460	0.7703	18.62
5.55	-0.0697	0.0288	0.0754	157.55	0.7326	0.2440	0.7722	18.42
5.60	-0.0691	0.0289	0.0749	157.30	0.7352	0.2420	0.7740	18.22
5.65	-0.0685	0.0290	0.0744	157.05	0.7377	0.2401	0.7758	18.03
5.70	-0.0680	0.0291	0.0740	156.80	0.7401	0.2382	0.7775	17.84
5.75	-0.0675	0.0292	0.0735	156.56	0.7426	0.2364	0.7793	17.66
5.80	-0.0669	0.0293	0.0731	156.33	0.7450	0.2345	0.7810	17.48
5.85	-0.0664	0.0294	0.0726	156.09	0.7473	0.2327	0.7827	17.30
5.90	-0.0659	0.0295	0.0722	155.87	0.7496	0.2310	0.7844	17.12
5.95	-0.0654	0.0296	0.0718	155.65	0.7519	0.2292	0.7860	16.95
6.00	-0.0649	0.0297	0.0713	155.43	0.7541	0.2275	0.7876	16.79
6.05	-0.0644	0.0297	0.0709	155.21	0.7562	0.2258	0.7892	16.62
6.10	-0.0639	0.0298	0.0705	155.00	0.7584	0.2241	0.7908	16.46
6.15	-0.0634	0.0298	0.0701	154.80	0.7605	0.2224	0.7924	16.30
6.20	-0.0629	0.0299	0.0696	154.60	0.7626	0.2208	0.7939	16.15
6.25	-0.0624	0.0299	0.0692	154.40	0.7646	0.2192	0.7954	16.00
6.30	-0.0620	0.0300	0.0688	154.20	0.7666	0.2176	0.7969	15.85
6.35	-0.0615	0.0300	0.0684	154.01	0.7686	0.2160	0.7983	15.70
6.40	-0.0611	0.0300	0.0680	153.83	0.7705	0.2145	0.7998	15.55
6.45	-0.0606	0.0300	0.0676	153.64	0.7724	0.2129	0.8012	15.41
6.50	-0.0602	0.0300	0.0673	153.46	0.7743	0.2114	0.8026	15.27
6.55	-0.0597	0.0301	0.0669	153.28	0.7761	0.2099	0.8040	15.14
6.60	-0.0593	0.0301	0.0665	153.11	0.7779	0.2085	0.8054	15.00
6.65	-0.0589	0.0301	0.0661	152.94	0.7797	0.2070	0.8067	14.87
6.70	-0.0584	0.0301	0.0657	152.77	0.7814	0.2056	0.8080	14.74
6.75	-0.0580	0.0301	0.0654	152.60	0.7832	0.2042	0.8093	14.61
6.80	-0.0576	0.0301	0.0650	152.44	0.7849	0.2028	0.8106	14.49
6.85	-0.0572	0.0301	0.0646	152.28	0.7865	0.2014	0.8119	14.36
6.90	-0.0568	0.0301	0.0643	152.12	0.7882	0.2000	0.8132	14.24
6.95	-0.0564	0.0300	0.0639	151.97	0.7898	0.1987	0.8144	14.12

$k = 0.2$ $\sigma = 0.00$									
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	1.1896	-0.2967	0.9099	0.7716	0.4623	1.0560	-0.0300	1.0565	358.37
7.05	1.1885	-0.2938	0.9105	0.7652	0.4652	1.0557	-0.0300	1.0561	358.37
7.10	1.1873	-0.2910	0.9110	0.7588	0.4682	1.0553	-0.0300	1.0557	358.37
7.15	1.1862	-0.2883	0.9116	0.7526	0.4711	1.0549	-0.0300	1.0553	358.37
7.20	1.1850	-0.2856	0.9121	0.7464	0.4740	1.0545	-0.0299	1.0550	358.37
7.25	1.1839	-0.2830	0.9126	0.7404	0.4769	1.0542	-0.0299	1.0546	358.38
7.30	1.1828	-0.2804	0.9132	0.7344	0.4798	1.0538	-0.0299	1.0542	358.38
7.35	1.1817	-0.2778	0.9137	0.7286	0.4826	1.0534	-0.0298	1.0539	358.38
7.40	1.1807	-0.2753	0.9142	0.7228	0.4854	1.0531	-0.0298	1.0535	358.38
7.45	1.1796	-0.2728	0.9147	0.7171	0.4882	1.0527	-0.0298	1.0532	358.38
7.50	1.1785	-0.2704	0.9152	0.7115	0.4909	1.0524	-0.0297	1.0528	358.38
7.55	1.1775	-0.2680	0.9157	0.7060	0.4936	1.0521	-0.0297	1.0525	358.38
7.60	1.1765	-0.2657	0.9162	0.7006	0.4963	1.0517	-0.0296	1.0521	358.39
7.65	1.1754	-0.2634	0.9167	0.6952	0.4990	1.0514	-0.0296	1.0518	358.39
7.70	1.1744	-0.2611	0.9172	0.6900	0.5016	1.0511	-0.0296	1.0515	358.39
7.75	1.1734	-0.2589	0.9176	0.6848	0.5042	1.0507	-0.0295	1.0512	358.39
7.80	1.1724	-0.2567	0.9181	0.6797	0.5068	1.0504	-0.0295	1.0508	358.39
7.85	1.1715	-0.2545	0.9186	0.6746	0.5093	1.0501	-0.0294	1.0505	358.40
7.90	1.1705	-0.2524	0.9190	0.6697	0.5119	1.0498	-0.0294	1.0502	358.40
7.95	1.1695	-0.2503	0.9195	0.6648	0.5144	1.0495	-0.0293	1.0499	358.40
8.00	1.1686	-0.2482	0.9199	0.6599	0.5169	1.0492	-0.0293	1.0496	358.40
8.05	1.1676	-0.2462	0.9204	0.6552	0.5193	1.0489	-0.0292	1.0493	358.40
8.10	1.1667	-0.2442	0.9208	0.6505	0.5218	1.0486	-0.0292	1.0490	358.41
8.15	1.1658	-0.2422	0.9213	0.6459	0.5242	1.0483	-0.0291	1.0487	358.41
8.20	1.1649	-0.2403	0.9217	0.6413	0.5266	1.0480	-0.0290	1.0484	358.41
8.25	1.1640	-0.2384	0.9221	0.6368	0.5290	1.0477	-0.0290	1.0481	358.42
8.30	1.1631	-0.2365	0.9225	0.6324	0.5313	1.0474	-0.0289	1.0478	358.42
8.35	1.1622	-0.2347	0.9230	0.6280	0.5337	1.0472	-0.0289	1.0476	358.42
8.40	1.1613	-0.2328	0.9234	0.6237	0.5360	1.0469	-0.0288	1.0473	358.42
8.45	1.1605	-0.2311	0.9238	0.6194	0.5383	1.0466	-0.0288	1.0470	358.43
8.50	1.1596	-0.2293	0.9242	0.6152	0.5405	1.0463	-0.0287	1.0467	358.43
8.55	1.1587	-0.2275	0.9246	0.6111	0.5428	1.0461	-0.0286	1.0465	358.43
8.60	1.1579	-0.2258	0.9250	0.6070	0.5450	1.0458	-0.0286	1.0462	358.44
8.65	1.1571	-0.2241	0.9254	0.6030	0.5472	1.0455	-0.0285	1.0459	358.44
8.70	1.1562	-0.2225	0.9257	0.5990	0.5494	1.0453	-0.0284	1.0457	358.44
8.75	1.1554	-0.2208	0.9261	0.5950	0.5515	1.0450	-0.0284	1.0454	358.44
8.80	1.1546	-0.2192	0.9265	0.5912	0.5537	1.0448	-0.0283	1.0452	358.45
8.85	1.1538	-0.2176	0.9269	0.5873	0.5558	1.0445	-0.0283	1.0449	358.45
8.90	1.1530	-0.2160	0.9273	0.5835	0.5579	1.0443	-0.0282	1.0447	358.45
8.95	1.1522	-0.2145	0.9276	0.5798	0.5600	1.0440	-0.0281	1.0444	358.46
9.00	1.1515	-0.2129	0.9280	0.5761	0.5621	1.0438	-0.0281	1.0442	358.46
9.05	1.1507	-0.2114	0.9283	0.5725	0.5641	1.0435	-0.0280	1.0439	358.46
9.10	1.1499	-0.2099	0.9287	0.5689	0.5662	1.0433	-0.0279	1.0437	358.47
9.15	1.1492	-0.2085	0.9291	0.5653	0.5682	1.0431	-0.0279	1.0434	358.47
9.20	1.1484	-0.2070	0.9294	0.5618	0.5702	1.0428	-0.0278	1.0432	358.47
9.25	1.1477	-0.2056	0.9298	0.5583	0.5722	1.0426	-0.0277	1.0430	358.48
9.30	1.1469	-0.2042	0.9301	0.5549	0.5741	1.0424	-0.0277	1.0427	358.48
9.35	1.1462	-0.2028	0.9304	0.5515	0.5761	1.0422	-0.0276	1.0425	358.48
9.40	1.1455	-0.2014	0.9308	0.5482	0.5780	1.0419	-0.0275	1.0423	358.49
9.45	1.1448	-0.2001	0.9311	0.5449	0.5799	1.0417	-0.0275	1.0421	358.49
9.50	1.1441	-0.1987	0.9314	0.5416	0.5818	1.0415	-0.0274	1.0419	358.49
9.55	1.1434	-0.1974	0.9318	0.5384	0.5837	1.0413	-0.0273	1.0416	358.50
9.60	1.1427	-0.1961	0.9321	0.5352	0.5855	1.0411	-0.0273	1.0414	358.50
9.65	1.1420	-0.1948	0.9324	0.5321	0.5874	1.0409	-0.0272	1.0412	358.50
9.70	1.1413	-0.1935	0.9327	0.5289	0.5892	1.0406	-0.0271	1.0410	358.51
9.75	1.1406	-0.1923	0.9330	0.5259	0.5910	1.0404	-0.0271	1.0408	358.51
9.80	1.1400	-0.1910	0.9334	0.5228	0.5928	1.0402	-0.0270	1.0406	358.51
9.85	1.1393	-0.1898	0.9337	0.5198	0.5946	1.0400	-0.0269	1.0404	358.52
9.90	1.1386	-0.1886	0.9340	0.5168	0.5964	1.0398	-0.0268	1.0402	358.52
9.95	1.1380	-0.1874	0.9343	0.5139	0.5982	1.0396	-0.0268	1.0400	358.52
10.00	1.1373	-0.1862	0.9346	0.5110	0.5999	1.0394	-0.0267	1.0398	358.53

$k = 0.2$ $\sigma = 0.00$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	-0.0560	0.0300	0.0636	151.82	0.7914	0.1974	0.8156	14.00
7.05	-0.0557	0.0300	0.0632	151.67	0.7930	0.1960	0.8168	13.89
7.10	-0.0553	0.0300	0.0629	151.52	0.7945	0.1947	0.8180	13.77
7.15	-0.0549	0.0300	0.0625	151.38	0.7960	0.1935	0.8192	13.66
7.20	-0.0545	0.0299	0.0622	151.24	0.7975	0.1922	0.8204	13.55
7.25	-0.0542	0.0299	0.0619	151.10	0.7990	0.1910	0.8215	13.44
7.30	-0.0538	0.0299	0.0615	150.96	0.8005	0.1897	0.8226	13.33
7.35	-0.0534	0.0298	0.0612	150.83	0.8019	0.1885	0.8238	13.23
7.40	-0.0531	0.0298	0.0609	150.69	0.8033	0.1873	0.8249	13.12
7.45	-0.0527	0.0298	0.0606	150.56	0.8047	0.1861	0.8259	13.02
7.50	-0.0524	0.0297	0.0602	150.43	0.8061	0.1849	0.8270	12.92
7.55	-0.0521	0.0297	0.0599	150.31	0.8074	0.1838	0.8281	12.82
7.60	-0.0517	0.0296	0.0596	150.18	0.8088	0.1826	0.8291	12.72
7.65	-0.0514	0.0296	0.0593	150.06	0.8101	0.1815	0.8302	12.63
7.70	-0.0511	0.0296	0.0590	149.94	0.8114	0.1804	0.8312	12.53
7.75	-0.0507	0.0295	0.0587	149.82	0.8127	0.1793	0.8322	12.44
7.80	-0.0504	0.0295	0.0584	149.70	0.8139	0.1782	0.8332	12.35
7.85	-0.0501	0.0294	0.0581	149.59	0.8152	0.1771	0.8342	12.26
7.90	-0.0498	0.0294	0.0578	149.47	0.8164	0.1760	0.8352	12.17
7.95	-0.0495	0.0293	0.0575	149.36	0.8176	0.1750	0.8361	12.08
8.00	-0.0492	0.0293	0.0572	149.25	0.8188	0.1739	0.8371	11.99
8.05	-0.0489	0.0292	0.0570	149.14	0.8200	0.1729	0.8380	11.91
8.10	-0.0486	0.0292	0.0567	149.04	0.8211	0.1719	0.8389	11.82
8.15	-0.0483	0.0291	0.0564	148.93	0.8223	0.1709	0.8399	11.74
8.20	-0.0480	0.0290	0.0561	148.83	0.8234	0.1699	0.8408	11.66
8.25	-0.0477	0.0290	0.0558	148.72	0.8245	0.1689	0.8417	11.57
8.30	-0.0474	0.0289	0.0556	148.62	0.8256	0.1679	0.8425	11.49
8.35	-0.0472	0.0289	0.0553	148.52	0.8267	0.1669	0.8434	11.42
8.40	-0.0469	0.0288	0.0550	148.43	0.8278	0.1660	0.8443	11.34
8.45	-0.0466	0.0288	0.0548	148.33	0.8289	0.1650	0.8451	11.26
8.50	-0.0463	0.0287	0.0545	148.23	0.8299	0.1641	0.8460	11.18
8.55	-0.0461	0.0286	0.0542	148.14	0.8310	0.1632	0.8468	11.11
8.60	-0.0458	0.0286	0.0540	148.05	0.8320	0.1623	0.8477	11.04
8.65	-0.0455	0.0285	0.0537	147.96	0.8330	0.1614	0.8485	10.96
8.70	-0.0453	0.0284	0.0535	147.87	0.8340	0.1605	0.8493	10.89
8.75	-0.0450	0.0284	0.0532	147.78	0.8350	0.1596	0.8501	10.82
8.80	-0.0448	0.0283	0.0530	147.69	0.8360	0.1587	0.8509	10.75
8.85	-0.0445	0.0283	0.0527	147.60	0.8369	0.1578	0.8517	10.68
8.90	-0.0443	0.0282	0.0525	147.52	0.8379	0.1570	0.8525	10.61
8.95	-0.0440	0.0281	0.0522	147.43	0.8388	0.1561	0.8532	10.54
9.00	-0.0438	0.0281	0.0520	147.35	0.8397	0.1553	0.8540	10.48
9.05	-0.0435	0.0280	0.0518	147.27	0.8407	0.1545	0.8547	10.41
9.10	-0.0433	0.0279	0.0515	147.19	0.8416	0.1536	0.8555	10.35
9.15	-0.0431	0.0279	0.0513	147.11	0.8425	0.1528	0.8562	10.28
9.20	-0.0428	0.0278	0.0511	147.03	0.8434	0.1520	0.8570	10.22
9.25	-0.0426	0.0277	0.0508	146.95	0.8442	0.1512	0.8577	10.16
9.30	-0.0424	0.0277	0.0506	146.87	0.8451	0.1504	0.8584	10.09
9.35	-0.0422	0.0276	0.0504	146.79	0.8460	0.1497	0.8591	10.03
9.40	-0.0419	0.0275	0.0502	146.72	0.8468	0.1489	0.8598	9.97
9.45	-0.0417	0.0275	0.0499	146.64	0.8476	0.1481	0.8605	9.91
9.50	-0.0415	0.0274	0.0497	146.57	0.8485	0.1474	0.8612	9.85
9.55	-0.0413	0.0273	0.0495	146.50	0.8493	0.1466	0.8619	9.80
9.60	-0.0411	0.0273	0.0493	146.43	0.8501	0.1459	0.8625	9.74
9.65	-0.0409	0.0272	0.0491	146.36	0.8509	0.1452	0.8632	9.68
9.70	-0.0406	0.0271	0.0489	146.29	0.8517	0.1444	0.8639	9.62
9.75	-0.0404	0.0271	0.0487	146.22	0.8525	0.1437	0.8645	9.57
9.80	-0.0402	0.0270	0.0484	146.15	0.8533	0.1430	0.8652	9.51
9.85	-0.0400	0.0269	0.0482	146.08	0.8540	0.1423	0.8658	9.46
9.90	-0.0398	0.0268	0.0480	146.01	0.8548	0.1416	0.8664	9.40
9.95	-0.0396	0.0268	0.0478	145.95	0.8556	0.1409	0.8671	9.35
10.00	-0.0394	0.0267	0.0476	145.88	0.8563	0.1402	0.8677	9.30

$k = 0.2 \qquad \sigma = 0.25$

a	$\frac{1-\sigma^2}{2}\cdot X$ REAL	$\frac{1-\sigma^2}{2}\cdot X$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
1.00	1.1069	-7.9872	0.4670	5.4725	0.0042	1.0052	0.0146	1.0053	0.83
1.05	1.1073	-7.2421	0.4870	5.3955	0.0045	1.0063	0.0158	1.0064	0.90
1.10	1.1077	-6.5961	0.5065	5.3160	0.0049	1.0075	0.0171	1.0077	0.97
1.15	1.1082	-6.0323	0.5255	5.2341	0.0053	1.0089	0.0183	1.0091	1.04
1.20	1.1087	-5.5373	0.5441	5.1498	0.0058	1.0105	0.0194	1.0106	1.10
1.25	1.1093	-5.1003	0.5622	5.0635	0.0063	1.0122	0.0205	1.0124	1.16
1.30	1.1100	-4.7125	0.5797	4.9751	0.0069	1.0140	0.0215	1.0143	1.22
1.35	1.1108	-4.3668	0.5967	4.8850	0.0076	1.0161	0.0224	1.0163	1.26
1.40	1.1116	-4.0573	0.6132	4.7932	0.0083	1.0183	0.0232	1.0186	1.30
1.45	1.1126	-3.7790	0.6292	4.7000	0.0091	1.0207	0.0238	1.0210	1.33
1.50	1.1136	-3.5280	0.6446	4.6055	0.0100	1.0232	0.0242	1.0235	1.35
1.55	1.1148	-3.3007	0.6595	4.5098	0.0110	1.0259	0.0244	1.0262	1.36
1.60	1.1160	-3.0942	0.6738	4.4132	0.0121	1.0287	0.0243	1.0290	1.35
1.65	1.1174	-2.9061	0.6875	4.3157	0.0134	1.0316	0.0240	1.0318	1.33
1.70	1.1189	-2.7342	0.7007	4.2177	0.0147	1.0345	0.0234	1.0348	1.30
1.75	1.1205	-2.5767	0.7134	4.1193	0.0163	1.0375	0.0226	1.0378	1.25
1.80	1.1222	-2.4321	0.7254	4.0207	0.0179	1.0405	0.0214	1.0408	1.18
1.85	1.1240	-2.2989	0.7369	3.9220	0.0198	1.0436	0.0198	1.0437	1.09
1.90	1.1259	-2.1761	0.7478	3.8235	0.0219	1.0465	0.0180	1.0466	0.99
1.95	1.1280	-2.0626	0.7582	3.7252	0.0241	1.0493	0.0158	1.0495	0.86
2.00	1.1302	-1.9575	0.7680	3.6276	0.0266	1.0520	0.0133	1.0521	0.72
2.05	1.1325	-1.8599	0.7773	3.5306	0.0293	1.0545	0.0105	1.0546	0.57
2.10	1.1349	-1.7693	0.7861	3.4345	0.0322	1.0568	0.0074	1.0569	0.40
2.15	1.1373	-1.6850	0.7943	3.3395	0.0355	1.0589	0.0040	1.0589	0.22
2.20	1.1399	-1.6065	0.8020	3.2459	0.0389	1.0606	0.0004	1.0606	0.02
2.25	1.1426	-1.5332	0.8092	3.1536	0.0427	1.0621	-0.0034	1.0621	359.82
2.30	1.1453	-1.4648	0.8159	3.0630	0.0467	1.0632	-0.0074	1.0632	359.60
2.35	1.1481	-1.4008	0.8221	2.9742	0.0511	1.0639	-0.0114	1.0640	359.38
2.40	1.1509	-1.3409	0.8279	2.8874	0.0557	1.0643	-0.0156	1.0644	359.16
2.45	1.1537	-1.2849	0.8333	2.8026	0.0607	1.0643	-0.0198	1.0645	358.94
2.50	1.1566	-1.2323	0.8382	2.7200	0.0659	1.0640	-0.0239	1.0642	358.71
2.55	1.1594	-1.1830	0.8428	2.6397	0.0714	1.0633	-0.0280	1.0636	358.49
2.60	1.1622	-1.1367	0.8470	2.5619	0.0772	1.0623	-0.0320	1.0627	358.27
2.65	1.1649	-1.0932	0.8509	2.4865	0.0832	1.0609	-0.0359	1.0616	358.06
2.70	1.1676	-1.0523	0.8544	2.4136	0.0895	1.0594	-0.0396	1.0601	357.86
2.75	1.1703	-1.0139	0.8577	2.3433	0.0960	1.0575	-0.0432	1.0584	357.66
2.80	1.1728	-0.9777	0.8607	2.2755	0.1027	1.0555	-0.0465	1.0565	357.48
2.85	1.1752	-0.9436	0.8635	2.2102	0.1097	1.0532	-0.0496	1.0544	357.30
2.90	1.1776	-0.9114	0.8660	2.1475	0.1168	1.0508	-0.0525	1.0521	357.14
2.95	1.1798	-0.8811	0.8684	2.0873	0.1240	1.0483	-0.0552	1.0497	356.99
3.00	1.1819	-0.8524	0.8705	2.0295	0.1314	1.0457	-0.0576	1.0473	356.84
3.05	1.1839	-0.8254	0.8725	1.9741	0.1389	1.0430	-0.0599	1.0447	356.71
3.10	1.1857	-0.7998	0.8744	1.9210	0.1465	1.0402	-0.0619	1.0421	356.59
3.15	1.1874	-0.7756	0.8761	1.8702	0.1541	1.0375	-0.0637	1.0394	356.49
3.20	1.1890	-0.7526	0.8777	1.8215	0.1618	1.0347	-0.0653	1.0367	356.39
3.25	1.1904	-0.7309	0.8792	1.7750	0.1695	1.0319	-0.0668	1.0341	356.30
3.30	1.1917	-0.7103	0.8806	1.7304	0.1772	1.0292	-0.0680	1.0314	356.22
3.35	1.1929	-0.6907	0.8819	1.6878	0.1849	1.0265	-0.0691	1.0288	356.15
3.40	1.1940	-0.6721	0.8832	1.6469	0.1926	1.0238	-0.0701	1.0262	356.08
3.45	1.1949	-0.6544	0.8844	1.6079	0.2003	1.0212	-0.0709	1.0236	356.03
3.50	1.1957	-0.6376	0.8855	1.5705	0.2079	1.0186	-0.0716	1.0211	355.98
3.55	1.1964	-0.6215	0.8865	1.5347	0.2155	1.0161	-0.0722	1.0186	355.93
3.60	1.1970	-0.6063	0.8876	1.5004	0.2230	1.0136	-0.0727	1.0162	355.90
3.65	1.1975	-0.5917	0.8886	1.4676	0.2305	1.0112	-0.0731	1.0139	355.87
3.70	1.1978	-0.5778	0.8895	1.4361	0.2378	1.0089	-0.0734	1.0116	355.84
3.75	1.1981	-0.5645	0.8904	1.4060	0.2451	1.0067	-0.0736	1.0093	355.82
3.80	1.1983	-0.5517	0.8913	1.3770	0.2523	1.0045	-0.0738	1.0072	355.80
3.85	1.1984	-0.5396	0.8922	1.3493	0.2594	1.0023	-0.0739	1.0051	355.78
3.90	1.1984	-0.5279	0.8930	1.3226	0.2664	1.0003	-0.0740	1.0030	355.77
3.95	1.1983	-0.5167	0.8939	1.2970	0.2734	0.9983	-0.0740	1.0010	355.76

k = 0.2					σ = 0.25			
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0052	-0.0146	0.0155	250.32	0.0134	0.1079	0.1087	82.94
1.05	-0.0063	-0.0158	0.0170	248.31	0.0162	0.1186	0.1197	82.22
1.10	-0.0075	-0.0171	0.0186	246.21	0.0195	0.1297	0.1311	81.47
1.15	-0.0089	-0.0183	0.0203	244.02	0.0232	0.1412	0.1431	80.68
1.20	-0.0105	-0.0194	0.0221	241.73	0.0274	0.1531	0.1555	79.86
1.25	-0.0122	-0.0205	0.0239	239.35	0.0321	0.1652	0.1683	79.01
1.30	-0.0140	-0.0215	0.0257	236.89	0.0374	0.1777	0.1816	78.12
1.35	-0.0161	-0.0224	0.0276	234.34	0.0432	0.1904	0.1953	77.21
1.40	-0.0183	-0.0232	0.0295	231.70	0.0497	0.2033	0.2093	76.26
1.45	-0.0207	-0.0238	0.0315	228.97	0.0569	0.2164	0.2238	75.28
1.50	-0.0232	-0.0242	0.0335	226.17	0.0647	0.2296	0.2385	74.27
1.55	-0.0259	-0.0244	0.0355	223.28	0.0732	0.2428	0.2535	73.23
1.60	-0.0287	-0.0243	0.0376	220.32	0.0824	0.2559	0.2689	72.16
1.65	-0.0316	-0.0240	0.0397	217.29	0.0923	0.2690	0.2844	71.07
1.70	-0.0345	-0.0234	0.0417	214.18	0.1029	0.2820	0.3002	69.95
1.75	-0.0375	-0.0226	0.0438	211.01	0.1143	0.2947	0.3161	68.80
1.80	-0.0405	-0.0214	0.0458	207.78	0.1264	0.3071	0.3321	67.64
1.85	-0.0436	-0.0198	0.0479	204.50	0.1391	0.3192	0.3482	66.45
1.90	-0.0465	-0.0180	0.0499	201.16	0.1526	0.3308	0.3643	65.24
1.95	-0.0493	-0.0158	0.0518	197.77	0.1667	0.3420	0.3804	64.02
2.00	-0.0520	-0.0133	0.0537	194.35	0.1814	0.3525	0.3965	62.78
2.05	-0.0545	-0.0105	0.0555	190.89	0.1966	0.3625	0.4124	61.52
2.10	-0.0568	-0.0074	0.0573	187.41	0.2124	0.3717	0.4281	60.26
2.15	-0.0589	-0.0040	0.0590	183.91	0.2286	0.3802	0.4436	58.99
2.20	-0.0606	-0.0004	0.0606	180.39	0.2451	0.3879	0.4589	57.72
2.25	-0.0621	0.0034	0.0622	176.87	0.2619	0.3948	0.4738	56.44
2.30	-0.0632	0.0074	0.0636	173.36	0.2790	0.4009	0.4884	55.16
2.35	-0.0639	0.0114	0.0649	169.85	0.2962	0.4061	0.5026	53.89
2.40	-0.0643	0.0156	0.0662	166.37	0.3134	0.4104	0.5164	52.63
2.45	-0.0643	0.0198	0.0673	162.91	0.3306	0.4138	0.5297	51.38
2.50	-0.0640	0.0239	0.0683	159.49	0.3476	0.4165	0.5425	50.15
2.55	-0.0633	0.0280	0.0692	156.10	0.3645	0.4182	0.5548	48.93
2.60	-0.0623	0.0320	0.0700	152.77	0.3811	0.4193	0.5666	47.73
2.65	-0.0609	0.0359	0.0707	149.49	0.3974	0.4195	0.5779	46.55
2.70	-0.0594	0.0396	0.0714	146.27	0.4134	0.4191	0.5887	45.40
2.75	-0.0575	0.0432	0.0719	143.11	0.4289	0.4181	0.5989	44.27
2.80	-0.0555	0.0465	0.0724	140.02	0.4439	0.4164	0.6086	43.17
2.85	-0.0532	0.0496	0.0728	137.00	0.4584	0.4142	0.6179	42.10
2.90	-0.0508	0.0525	0.0731	134.05	0.4725	0.4116	0.6266	41.06
2.95	-0.0483	0.0552	0.0733	131.18	0.4860	0.4086	0.6349	40.05
3.00	-0.0457	0.0576	0.0735	128.38	0.4990	0.4052	0.6427	39.08
3.05	-0.0430	0.0599	0.0737	125.66	0.5114	0.4015	0.6502	38.13
3.10	-0.0402	0.0619	0.0738	123.02	0.5233	0.3975	0.6572	37.22
3.15	-0.0375	0.0637	0.0739	120.46	0.5347	0.3933	0.6638	36.34
3.20	-0.0347	0.0653	0.0740	117.97	0.5456	0.3890	0.6701	35.49
3.25	-0.0319	0.0668	0.0740	115.55	0.5560	0.3845	0.6760	34.67
3.30	-0.0292	0.0680	0.0740	113.21	0.5659	0.3800	0.6816	33.88
3.35	-0.0265	0.0691	0.0740	110.94	0.5753	0.3754	0.6870	33.12
3.40	-0.0238	0.0701	0.0740	108.74	0.5844	0.3707	0.6920	32.39
3.45	-0.0212	0.0709	0.0740	106.61	0.5930	0.3660	0.6968	31.68
3.50	-0.0186	0.0716	0.0740	104.55	0.6012	0.3613	0.7014	31.01
3.55	-0.0161	0.0722	0.0740	102.55	0.6090	0.3567	0.7058	30.36
3.60	-0.0136	0.0727	0.0740	100.62	0.6165	0.3521	0.7099	29.73
3.65	-0.0112	0.0731	0.0740	98.74	0.6236	0.3475	0.7139	29.13
3.70	-0.0089	0.0734	0.0739	96.93	0.6305	0.3430	0.7177	28.54
3.75	-0.0067	0.0736	0.0739	95.17	0.6370	0.3385	0.7214	27.99
3.80	-0.0045	0.0738	0.0739	93.46	0.6433	0.3341	0.7249	27.45
3.85	-0.0023	0.0739	0.0740	91.81	0.6493	0.3298	0.7283	26.93
3.90	-0.0003	0.0740	0.0740	90.21	0.6550	0.3256	0.7315	26.43
3.95	0.0017	0.0740	0.0740	88.65	0.6606	0.3215	0.7346	25.95

	$k = 0.2$			$\sigma = 0.25$					
a	$\frac{1-\sigma^2}{2}\cdot X$ REAL	$\frac{1-\sigma^2}{2}\cdot X$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
4.00	1.1981	-0.5060	0.8947	1.2724	0.2802	0.9963	-0.0740	0.9991	355.75
4.05	1.1979	-0.4957	0.8954	1.2487	0.2869	0.9944	-0.0739	0.9972	355.75
4.10	1.1976	-0.4858	0.8962	1.2259	0.2935	0.9926	-0.0738	0.9953	355.75
4.15	1.1972	-0.4763	0.8970	1.2040	0.3000	0.9908	-0.0737	0.9936	355.75
4.20	1.1968	-0.4672	0.8977	1.1828	0.3064	0.9891	-0.0735	0.9918	355.75
4.25	1.1963	-0.4584	0.8985	1.1625	0.3127	0.9874	-0.0733	0.9901	355.75
4.30	1.1958	-0.4499	0.8992	1.1428	0.3189	0.9858	-0.0731	0.9885	355.76
4.35	1.1952	-0.4417	0.8999	1.1239	0.3250	0.9842	-0.0729	0.9869	355.76
4.40	1.1946	-0.4338	0.9007	1.1055	0.3310	0.9827	-0.0727	0.9853	355.77
4.45	1.1939	-0.4262	0.9014	1.0879	0.3369	0.9812	-0.0724	0.9838	355.78
4.50	1.1932	-0.4188	0.9021	1.0707	0.3428	0.9797	-0.0722	0.9824	355.79
4.55	1.1924	-0.4117	0.9028	1.0542	0.3485	0.9783	-0.0719	0.9809	355.80
4.60	1.1917	-0.4049	0.9035	1.0382	0.3541	0.9769	-0.0716	0.9795	355.81
4.65	1.1909	-0.3982	0.9042	1.0227	0.3596	0.9756	-0.0714	0.9782	355.82
4.70	1.1900	-0.3918	0.9048	1.0076	0.3651	0.9742	-0.0711	0.9768	355.83
4.75	1.1892	-0.3855	0.9055	0.9930	0.3704	0.9730	-0.0708	0.9755	355.84
4.80	1.1883	-0.3795	0.9062	0.9789	0.3757	0.9717	-0.0705	0.9743	355.85
4.85	1.1874	-0.3736	0.9068	0.9652	0.3809	0.9705	-0.0702	0.9730	355.86
4.90	1.1864	-0.3679	0.9075	0.9518	0.3860	0.9693	-0.0699	0.9718	355.88
4.95	1.1855	-0.3624	0.9081	0.9389	0.3911	0.9681	-0.0696	0.9706	355.89
5.00	1.1845	-0.3570	0.9088	0.9263	0.3960	0.9670	-0.0693	0.9695	355.90
5.05	1.1836	-0.3518	0.9094	0.9140	0.4009	0.9659	-0.0689	0.9683	355.92
5.10	1.1826	-0.3467	0.9100	0.9021	0.4057	0.9648	-0.0686	0.9672	355.93
5.15	1.1816	-0.3418	0.9107	0.8905	0.4105	0.9637	-0.0683	0.9661	355.95
5.20	1.1806	-0.3370	0.9113	0.8791	0.4151	0.9627	-0.0680	0.9651	355.96
5.25	1.1796	-0.3323	0.9119	0.8681	0.4197	0.9617	-0.0677	0.9640	355.97
5.30	1.1786	-0.3277	0.9125	0.8574	0.4243	0.9607	-0.0674	0.9630	355.99
5.35	1.1776	-0.3233	0.9131	0.8469	0.4288	0.9597	-0.0670	0.9620	356.00
5.40	1.1765	-0.3190	0.9137	0.8366	0.4332	0.9587	-0.0667	0.9610	356.02
5.45	1.1755	-0.3148	0.9143	0.8266	0.4375	0.9578	-0.0664	0.9601	356.03
5.50	1.1745	-0.3106	0.9149	0.8169	0.4418	0.9568	-0.0661	0.9591	356.05
5.55	1.1735	-0.3066	0.9155	0.8074	0.4460	0.9559	-0.0658	0.9582	356.07
5.60	1.1725	-0.3027	0.9161	0.7981	0.4502	0.9550	-0.0654	0.9573	356.08
5.65	1.1714	-0.2989	0.9166	0.7890	0.4543	0.9542	-0.0651	0.9564	356.10
5.70	1.1704	-0.2952	0.9172	0.7801	0.4584	0.9533	-0.0648	0.9555	356.11
5.75	1.1694	-0.2915	0.9177	0.7714	0.4624	0.9525	-0.0645	0.9546	356.13
5.80	1.1684	-0.2880	0.9183	0.7628	0.4663	0.9516	-0.0642	0.9538	356.14
5.85	1.1674	-0.2845	0.9188	0.7545	0.4702	0.9508	-0.0638	0.9530	356.16
5.90	1.1664	-0.2811	0.9194	0.7464	0.4741	0.9500	-0.0635	0.9521	356.17
5.95	1.1654	-0.2777	0.9199	0.7384	0.4779	0.9492	-0.0632	0.9513	356.19
6.00	1.1644	-0.2745	0.9204	0.7305	0.4816	0.9485	-0.0629	0.9505	356.21
6.05	1.1634	-0.2713	0.9209	0.7229	0.4854	0.9477	-0.0626	0.9498	356.22
6.10	1.1625	-0.2682	0.9215	0.7154	0.4890	0.9470	-0.0623	0.9490	356.24
6.15	1.1615	-0.2651	0.9220	0.7080	0.4926	0.9462	-0.0620	0.9482	356.25
6.20	1.1605	-0.2621	0.9225	0.7008	0.4962	0.9455	-0.0617	0.9475	356.27
6.25	1.1596	-0.2592	0.9230	0.6937	0.4997	0.9448	-0.0614	0.9468	356.28
6.30	1.1586	-0.2564	0.9235	0.6868	0.5032	0.9441	-0.0611	0.9461	356.30
6.35	1.1577	-0.2535	0.9239	0.6800	0.5066	0.9434	-0.0607	0.9454	356.32
6.40	1.1568	-0.2508	0.9244	0.6733	0.5100	0.9427	-0.0604	0.9447	356.33
6.45	1.1558	-0.2481	0.9249	0.6668	0.5134	0.9421	-0.0601	0.9440	356.35
6.50	1.1549	-0.2455	0.9254	0.6603	0.5167	0.9414	-0.0598	0.9433	356.36
6.55	1.1540	-0.2429	0.9258	0.6540	0.5199	0.9408	-0.0595	0.9427	356.38
6.60	1.1531	-0.2403	0.9263	0.6478	0.5232	0.9401	-0.0592	0.9420	356.39
6.65	1.1522	-0.2379	0.9267	0.6417	0.5264	0.9395	-0.0589	0.9414	356.41
6.70	1.1513	-0.2354	0.9272	0.6358	0.5295	0.9389	-0.0587	0.9407	356.43
6.75	1.1505	-0.2330	0.9276	0.6299	0.5326	0.9383	-0.0584	0.9401	356.44
6.80	1.1496	-0.2307	0.9281	0.6241	0.5357	0.9377	-0.0581	0.9395	356.46
6.85	1.1487	-0.2284	0.9285	0.6185	0.5388	0.9371	-0.0578	0.9389	356.47
6.90	1.1479	-0.2261	0.9289	0.6129	0.5418	0.9366	-0.0575	0.9383	356.49
6.95	1.1470	-0.2239	0.9293	0.6075	0.5447	0.9360	-0.0572	0.9377	356.50

$k = 0.2$ $\sigma = 0.25$

a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.0037	0.0740	0.0741	87.15	0.6659	0.3174	0.7377	25.49
4.05	0.0056	0.0739	0.0741	85.69	0.6710	0.3135	0.7406	25.04
4.10	0.0074	0.0738	0.0742	84.27	0.6759	0.3096	0.7434	24.61
4.15	0.0092	0.0737	0.0742	82.89	0.6806	0.3058	0.7462	24.19
4.20	0.0109	0.0735	0.0743	81.56	0.6852	0.3021	0.7489	23.79
4.25	0.0126	0.0733	0.0744	80.26	0.6896	0.2985	0.7515	23.40
4.30	0.0142	0.0731	0.0745	79.00	0.6939	0.2949	0.7540	23.03
4.35	0.0158	0.0729	0.0746	77.77	0.6980	0.2915	0.7565	22.67
4.40	0.0173	0.0727	0.0747	76.58	0.7020	0.2881	0.7589	22.31
4.45	0.0188	0.0724	0.0748	75.42	0.7059	0.2848	0.7612	21.98
4.50	0.0203	0.0722	0.0750	74.30	0.7097	0.2816	0.7635	21.65
4.55	0.0217	0.0719	0.0751	73.20	0.7133	0.2785	0.7657	21.33
4.60	0.0231	0.0716	0.0753	72.13	0.7169	0.2754	0.7679	21.02
4.65	0.0244	0.0714	0.0754	71.10	0.7203	0.2724	0.7701	20.72
4.70	0.0258	0.0711	0.0756	70.08	0.7237	0.2695	0.7722	20.43
4.75	0.0270	0.0708	0.0758	69.10	0.7269	0.2667	0.7743	20.15
4.80	0.0283	0.0705	0.0759	68.14	0.7301	0.2639	0.7763	19.87
4.85	0.0295	0.0702	0.0761	67.20	0.7332	0.2611	0.7783	19.60
4.90	0.0307	0.0699	0.0763	66.28	0.7362	0.2585	0.7803	19.35
4.95	0.0319	0.0696	0.0765	65.39	0.7392	0.2559	0.7822	19.09
5.00	0.0330	0.0693	0.0767	64.52	0.7420	0.2533	0.7841	18.85
5.05	0.0341	0.0689	0.0769	63.67	0.7449	0.2508	0.7860	18.61
5.10	0.0352	0.0686	0.0771	62.84	0.7476	0.2483	0.7878	18.38
5.15	0.0363	0.0683	0.0773	62.03	0.7503	0.2459	0.7896	18.15
5.20	0.0373	0.0680	0.0776	61.24	0.7529	0.2436	0.7914	17.93
5.25	0.0383	0.0677	0.0778	60.47	0.7555	0.2413	0.7931	17.71
5.30	0.0393	0.0674	0.0780	59.71	0.7580	0.2390	0.7948	17.50
5.35	0.0403	0.0670	0.0782	58.97	0.7605	0.2368	0.7965	17.29
5.40	0.0413	0.0667	0.0785	58.25	0.7629	0.2346	0.7982	17.09
5.45	0.0422	0.0664	0.0787	57.54	0.7653	0.2325	0.7998	16.90
5.50	0.0432	0.0661	0.0789	56.85	0.7676	0.2304	0.8014	16.70
5.55	0.0441	0.0658	0.0792	56.17	0.7699	0.2283	0.8030	16.52
5.60	0.0450	0.0654	0.0794	55.51	0.7721	0.2263	0.8046	16.33
5.65	0.0458	0.0651	0.0796	54.86	0.7743	0.2243	0.8061	16.15
5.70	0.0467	0.0648	0.0799	54.22	0.7764	0.2223	0.8076	15.98
5.75	0.0475	0.0645	0.0801	53.60	0.7785	0.2204	0.8091	15.81
5.80	0.0484	0.0642	0.0804	52.99	0.7806	0.2185	0.8106	15.64
5.85	0.0492	0.0638	0.0806	52.39	0.7826	0.2166	0.8121	15.47
5.90	0.0500	0.0635	0.0808	51.81	0.7846	0.2148	0.8135	15.31
5.95	0.0508	0.0632	0.0811	51.23	0.7866	0.2130	0.8149	15.15
6.00	0.0515	0.0629	0.0813	50.67	0.7885	0.2113	0.8163	15.00
6.05	0.0523	0.0626	0.0816	50.12	0.7904	0.2095	0.8177	14.85
6.10	0.0530	0.0623	0.0818	49.58	0.7922	0.2078	0.8190	14.70
6.15	0.0538	0.0620	0.0821	49.05	0.7941	0.2061	0.8204	14.55
6.20	0.0545	0.0617	0.0823	48.53	0.7959	0.2044	0.8217	14.41
6.25	0.0552	0.0614	0.0825	48.02	0.7976	0.2028	0.8230	14.27
6.30	0.0559	0.0611	0.0828	47.52	0.7993	0.2012	0.8243	14.13
6.35	0.0566	0.0607	0.0830	47.03	0.8010	0.1996	0.8255	13.99
6.40	0.0573	0.0604	0.0833	46.55	0.8027	0.1980	0.8268	13.86
6.45	0.0579	0.0601	0.0835	46.07	0.8043	0.1965	0.8280	13.73
6.50	0.0586	0.0598	0.0837	45.61	0.8060	0.1950	0.8292	13.60
6.55	0.0592	0.0595	0.0840	45.15	0.8075	0.1935	0.8304	13.47
6.60	0.0599	0.0592	0.0842	44.71	0.8091	0.1920	0.8316	13.35
6.65	0.0605	0.0589	0.0845	44.27	0.8106	0.1906	0.8327	13.23
6.70	0.0611	0.0587	0.0847	43.83	0.8121	0.1891	0.8339	13.11
6.75	0.0617	0.0584	0.0849	43.41	0.8136	0.1877	0.8350	12.99
6.80	0.0623	0.0581	0.0852	42.99	0.8151	0.1863	0.8361	12.88
6.85	0.0629	0.0578	0.0854	42.58	0.8165	0.1850	0.8372	12.76
6.90	0.0634	0.0575	0.0856	42.18	0.8179	0.1836	0.8383	12.65
6.95	0.0640	0.0572	0.0859	41.79	0.8193	0.1823	0.8394	12.54

$k = 0.2$ $\sigma = 0.25$									
a	$\frac{1-\sigma^2}{2} \cdot x$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	1.1462	-0.2217	0.9298	0.6021	0.5477	0.9354	-0.0569	0.9372	356.52
7.05	1.1454	-0.2196	0.9302	0.5968	0.5506	0.9349	-0.0566	0.9366	356.53
7.10	1.1446	-0.2175	0.9306	0.5916	0.5534	0.9343	-0.0564	0.9360	356.55
7.15	1.1437	-0.2154	0.9310	0.5865	0.5563	0.9338	-0.0561	0.9355	356.56
7.20	1.1429	-0.2134	0.9314	0.5815	0.5591	0.9333	-0.0558	0.9349	356.58
7.25	1.1421	-0.2114	0.9318	0.5765	0.5618	0.9328	-0.0555	0.9344	356.59
7.30	1.1414	-0.2094	0.9321	0.5717	0.5646	0.9322	-0.0553	0.9339	356.61
7.35	1.1406	-0.2075	0.9325	0.5669	0.5673	0.9317	-0.0550	0.9334	356.62
7.40	1.1398	-0.2056	0.9329	0.5622	0.5699	0.9312	-0.0547	0.9329	356.64
7.45	1.1390	-0.2038	0.9333	0.5576	0.5726	0.9308	-0.0545	0.9324	356.65
7.50	1.1383	-0.2019	0.9337	0.5530	0.5752	0.9303	-0.0542	0.9319	356.67
7.55	1.1375	-0.2002	0.9340	0.5486	0.5778	0.9298	-0.0539	0.9314	356.68
7.60	1.1368	-0.1984	0.9344	0.5441	0.5803	0.9293	-0.0537	0.9309	356.69
7.65	1.1361	-0.1967	0.9347	0.5398	0.5829	0.9289	-0.0534	0.9304	356.71
7.70	1.1353	-0.1949	0.9351	0.5355	0.5854	0.9284	-0.0532	0.9299	356.72
7.75	1.1346	-0.1933	0.9354	0.5313	0.5878	0.9280	-0.0529	0.9295	356.74
7.80	1.1339	-0.1916	0.9358	0.5272	0.5903	0.9275	-0.0526	0.9290	356.75
7.85	1.1332	-0.1900	0.9361	0.5231	0.5927	0.9271	-0.0524	0.9286	356.77
7.90	1.1325	-0.1884	0.9365	0.5191	0.5951	0.9267	-0.0521	0.9281	356.78
7.95	1.1318	-0.1868	0.9368	0.5151	0.5974	0.9262	-0.0519	0.9277	356.79
8.00	1.1311	-0.1853	0.9371	0.5112	0.5998	0.9258	-0.0516	0.9273	356.81
8.05	1.1304	-0.1838	0.9375	0.5074	0.6021	0.9254	-0.0514	0.9268	356.82
8.10	1.1298	-0.1823	0.9378	0.5036	0.6044	0.9250	-0.0512	0.9264	356.83
8.15	1.1291	-0.1808	0.9381	0.4998	0.6066	0.9246	-0.0509	0.9260	356.85
8.20	1.1284	-0.1793	0.9384	0.4962	0.6089	0.9242	-0.0507	0.9256	356.86
8.25	1.1278	-0.1779	0.9387	0.4925	0.6111	0.9238	-0.0504	0.9252	356.87
8.30	1.1271	-0.1765	0.9391	0.4890	0.6133	0.9234	-0.0502	0.9248	356.89
8.35	1.1265	-0.1751	0.9394	0.4854	0.6154	0.9230	-0.0500	0.9244	356.90
8.40	1.1259	-0.1737	0.9397	0.4820	0.6176	0.9226	-0.0498	0.9240	356.91
8.45	1.1252	-0.1724	0.9400	0.4785	0.6197	0.9223	-0.0495	0.9236	356.93
8.50	1.1246	-0.1711	0.9403	0.4752	0.6218	0.9219	-0.0493	0.9232	356.94
8.55	1.1240	-0.1698	0.9406	0.4718	0.6239	0.9215	-0.0491	0.9228	356.95
8.60	1.1234	-0.1685	0.9409	0.4685	0.6259	0.9212	-0.0488	0.9225	356.96
8.65	1.1228	-0.1672	0.9411	0.4653	0.6279	0.9208	-0.0486	0.9221	356.98
8.70	1.1222	-0.1660	0.9414	0.4621	0.6300	0.9205	-0.0484	0.9217	356.99
8.75	1.1216	-0.1647	0.9417	0.4590	0.6319	0.9201	-0.0482	0.9214	357.00
8.80	1.1210	-0.1635	0.9420	0.4558	0.6339	0.9198	-0.0480	0.9210	357.01
8.85	1.1204	-0.1623	0.9423	0.4528	0.6359	0.9194	-0.0478	0.9207	357.03
8.90	1.1199	-0.1611	0.9425	0.4497	0.6378	0.9191	-0.0475	0.9203	357.04
8.95	1.1193	-0.1600	0.9428	0.4467	0.6397	0.9188	-0.0473	0.9200	357.05
9.00	1.1187	-0.1588	0.9431	0.4438	0.6416	0.9185	-0.0471	0.9197	357.06
9.05	1.1182	-0.1577	0.9434	0.4409	0.6435	0.9181	-0.0469	0.9193	357.08
9.10	1.1176	-0.1566	0.9436	0.4380	0.6453	0.9178	-0.0467	0.9190	357.09
9.15	1.1171	-0.1555	0.9439	0.4352	0.6472	0.9175	-0.0465	0.9187	357.10
9.20	1.1165	-0.1544	0.9441	0.4324	0.6490	0.9172	-0.0463	0.9183	357.11
9.25	1.1160	-0.1533	0.9444	0.4296	0.6508	0.9169	-0.0461	0.9180	357.12
9.30	1.1154	-0.1523	0.9447	0.4269	0.6526	0.9166	-0.0459	0.9177	357.13
9.35	1.1149	-0.1512	0.9449	0.4242	0.6543	0.9163	-0.0457	0.9174	357.15
9.40	1.1144	-0.1502	0.9452	0.4215	0.6561	0.9160	-0.0455	0.9171	357.16
9.45	1.1139	-0.1492	0.9454	0.4189	0.6578	0.9157	-0.0453	0.9168	357.17
9.50	1.1133	-0.1482	0.9457	0.4163	0.6595	0.9154	-0.0451	0.9165	357.18
9.55	1.1128	-0.1472	0.9459	0.4137	0.6612	0.9151	-0.0449	0.9162	357.19
9.60	1.1123	-0.1462	0.9461	0.4112	0.6629	0.9148	-0.0447	0.9159	357.20
9.65	1.1118	-0.1452	0.9464	0.4086	0.6646	0.9145	-0.0445	0.9156	357.21
9.70	1.1113	-0.1443	0.9466	0.4062	0.6662	0.9142	-0.0443	0.9153	357.22
9.75	1.1108	-0.1433	0.9468	0.4037	0.6678	0.9140	-0.0442	0.9150	357.23
9.80	1.1103	-0.1424	0.9471	0.4013	0.6695	0.9137	-0.0440	0.9148	357.25
9.85	1.1098	-0.1415	0.9473	0.3989	0.6711	0.9134	-0.0438	0.9145	357.26
9.90	1.1094	-0.1406	0.9475	0.3965	0.6726	0.9132	-0.0436	0.9142	357.27
9.95	1.1089	-0.1397	0.9478	0.3942	0.6742	0.9129	-0.0434	0.9139	357.28
10.00	1.1084	-0.1388	0.9480	0.3919	0.6758	0.9126	-0.0432	0.9137	357.29

$k = 0.2$ $\sigma = 0.25$

a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.0646	0.0569	0.0861	41.40	0.8207	0.1810	0.8404	12.43
7.05	0.0651	0.0566	0.0863	41.02	0.8221	0.1797	0.8415	12.33
7.10	0.0657	0.0564	0.0865	40.64	0.8234	0.1784	0.8425	12.22
7.15	0.0662	0.0561	0.0868	40.27	0.8247	0.1771	0.8435	12.12
7.20	0.0667	0.0558	0.0870	39.91	0.8260	0.1759	0.8445	12.02
7.25	0.0672	0.0555	0.0872	39.55	0.8273	0.1747	0.8455	11.92
7.30	0.0678	0.0553	0.0874	39.20	0.8285	0.1734	0.8465	11.82
7.35	0.0683	0.0550	0.0877	38.86	0.8297	0.1722	0.8474	11.73
7.40	0.0688	0.0547	0.0879	38.52	0.8310	0.1711	0.8484	11.63
7.45	0.0692	0.0545	0.0881	38.19	0.8322	0.1699	0.8493	11.54
7.50	0.0697	0.0542	0.0883	37.86	0.8333	0.1688	0.8503	11.45
7.55	0.0702	0.0539	0.0885	37.53	0.8345	0.1676	0.8512	11.36
7.60	0.0707	0.0537	0.0887	37.22	0.8356	0.1665	0.8521	11.27
7.65	0.0711	0.0534	0.0889	36.90	0.8368	0.1654	0.8530	11.18
7.70	0.0716	0.0532	0.0892	36.60	0.8379	0.1643	0.8538	11.09
7.75	0.0720	0.0529	0.0894	36.29	0.8390	0.1632	0.8547	11.01
7.80	0.0725	0.0526	0.0896	35.99	0.8401	0.1622	0.8556	10.93
7.85	0.0729	0.0524	0.0898	35.70	0.8411	0.1611	0.8564	10.84
7.90	0.0733	0.0521	0.0900	35.41	0.8422	0.1601	0.8573	10.76
7.95	0.0738	0.0519	0.0902	35.13	0.8432	0.1591	0.8581	10.68
8.00	0.0742	0.0516	0.0904	34.85	0.8443	0.1580	0.8589	10.60
8.05	0.0746	0.0514	0.0906	34.57	0.8453	0.1570	0.8597	10.53
8.10	0.0750	0.0512	0.0908	34.30	0.8463	0.1561	0.8605	10.45
8.15	0.0754	0.0509	0.0910	34.03	0.8473	0.1551	0.8613	10.37
8.20	0.0758	0.0507	0.0912	33.77	0.8482	0.1541	0.8621	10.30
8.25	0.0762	0.0504	0.0914	33.51	0.8492	0.1532	0.8629	10.22
8.30	0.0766	0.0502	0.0916	33.25	0.8501	0.1522	0.8637	10.15
8.35	0.0770	0.0500	0.0918	33.00	0.8511	0.1513	0.8644	10.08
8.40	0.0774	0.0498	0.0920	32.75	0.8520	0.1504	0.8652	10.01
8.45	0.0777	0.0495	0.0922	32.50	0.8529	0.1495	0.8659	9.94
8.50	0.0781	0.0493	0.0924	32.26	0.8538	0.1486	0.8666	9.87
8.55	0.0785	0.0491	0.0925	32.02	0.8547	0.1477	0.8674	9.80
8.60	0.0788	0.0488	0.0927	31.79	0.8556	0.1468	0.8681	9.74
8.65	0.0792	0.0486	0.0929	31.55	0.8564	0.1460	0.8688	9.67
8.70	0.0795	0.0484	0.0931	31.33	0.8573	0.1451	0.8695	9.61
8.75	0.0799	0.0482	0.0933	31.10	0.8581	0.1443	0.8702	9.54
8.80	0.0802	0.0480	0.0935	30.88	0.8590	0.1434	0.8709	9.48
8.85	0.0806	0.0478	0.0936	30.66	0.8598	0.1426	0.8716	9.42
8.90	0.0809	0.0475	0.0938	30.44	0.8606	0.1418	0.8722	9.36
8.95	0.0812	0.0473	0.0940	30.23	0.8614	0.1410	0.8729	9.29
9.00	0.0815	0.0471	0.0942	30.02	0.8622	0.1402	0.8736	9.23
9.05	0.0819	0.0469	0.0944	29.81	0.8630	0.1394	0.8742	9.18
9.10	0.0822	0.0467	0.0945	29.61	0.8638	0.1386	0.8748	9.12
9.15	0.0825	0.0465	0.0947	29.40	0.8646	0.1378	0.8755	9.06
9.20	0.0828	0.0463	0.0949	29.20	0.8653	0.1371	0.8761	9.00
9.25	0.0831	0.0461	0.0950	29.01	0.8661	0.1363	0.8767	8.95
9.30	0.0834	0.0459	0.0952	28.81	0.8668	0.1356	0.8774	8.89
9.35	0.0837	0.0457	0.0954	28.62	0.8676	0.1348	0.8780	8.83
9.40	0.0840	0.0455	0.0956	28.43	0.8683	0.1341	0.8786	8.78
9.45	0.0843	0.0453	0.0957	28.24	0.8690	0.1334	0.8792	8.73
9.50	0.0846	0.0451	0.0959	28.06	0.8697	0.1327	0.8798	8.67
9.55	0.0849	0.0449	0.0961	27.88	0.8704	0.1320	0.8804	8.62
9.60	0.0852	0.0447	0.0962	27.70	0.8711	0.1313	0.8810	8.57
9.65	0.0855	0.0445	0.0964	27.52	0.8718	0.1306	0.8815	8.52
9.70	0.0858	0.0443	0.0965	27.34	0.8725	0.1299	0.8821	8.47
9.75	0.0860	0.0442	0.0967	27.17	0.8732	0.1292	0.8827	8.42
9.80	0.0863	0.0440	0.0969	27.00	0.8738	0.1285	0.8832	8.37
9.85	0.0866	0.0438	0.0970	26.83	0.8745	0.1279	0.8838	8.32
9.90	0.0868	0.0436	0.0972	26.66	0.8751	0.1272	0.8843	8.27
9.95	0.0871	0.0434	0.0973	26.49	0.8758	0.1266	0.8849	8.22
10.00	0.0874	0.0432	0.0975	26.33	0.8764	0.1259	0.8854	8.18

$k = 0.2$						$\sigma = 0.50$			
a	$\frac{1-\sigma^2}{2} \cdot X$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.0032	-5.9742	0.5322	5.3161	0.0049	1.0050	-0.0014	1.0050	359.92
1.05	1.0039	-5.4138	0.5543	5.2252	0.0054	1.0060	-0.0019	1.0060	359.89
1.10	1.0047	-4.9276	0.5757	5.1313	0.0059	1.0071	-0.0025	1.0071	359.86
1.15	1.0056	-4.5030	0.5966	5.0348	0.0065	1.0083	-0.0032	1.0083	359.82
1.20	1.0067	-4.1299	0.6168	4.9356	0.0072	1.0097	-0.0041	1.0097	359.77
1.25	1.0079	-3.8002	0.6363	4.8340	0.0080	1.0112	-0.0052	1.0112	359.71
1.30	1.0092	-3.5074	0.6552	4.7302	0.0088	1.0129	-0.0065	1.0129	359.63
1.35	1.0107	-3.2462	0.6734	4.6244	0.0098	1.0146	-0.0080	1.0146	359.55
1.40	1.0124	-3.0120	0.6909	4.5167	0.0109	1.0164	-0.0098	1.0165	359.44
1.45	1.0143	-2.8013	0.7077	4.4074	0.0122	1.0183	-0.0120	1.0184	359.33
1.50	1.0163	-2.6109	0.7238	4.2966	0.0136	1.0202	-0.0145	1.0203	359.19
1.55	1.0186	-2.4383	0.7391	4.1846	0.0152	1.0221	-0.0173	1.0223	359.03
1.60	1.0211	-2.2813	0.7537	4.0715	0.0171	1.0240	-0.0205	1.0242	358.85
1.65	1.0239	-2.1381	0.7676	3.9577	0.0191	1.0258	-0.0241	1.0261	358.65
1.70	1.0269	-2.0071	0.7807	3.8432	0.0214	1.0274	-0.0281	1.0278	358.43
1.75	1.0301	-1.8870	0.7931	3.7285	0.0240	1.0288	-0.0325	1.0294	358.19
1.80	1.0336	-1.7766	0.8047	3.6137	0.0270	1.0300	-0.0374	1.0307	357.92
1.85	1.0373	-1.6749	0.8155	3.4992	0.0302	1.0308	-0.0426	1.0317	357.63
1.90	1.0413	-1.5810	0.8256	3.3852	0.0339	1.0313	-0.0481	1.0324	357.33
1.95	1.0455	-1.4942	0.8349	3.2721	0.0379	1.0312	-0.0540	1.0327	357.00
2.00	1.0500	-1.4139	0.8435	3.1602	0.0424	1.0307	-0.0601	1.0325	356.66
2.05	1.0547	-1.3395	0.8513	3.0499	0.0474	1.0296	-0.0664	1.0317	356.31
2.10	1.0595	-1.2705	0.8585	2.9415	0.0528	1.0279	-0.0727	1.0305	355.95
2.15	1.0645	-1.2064	0.8649	2.8353	0.0587	1.0256	-0.0791	1.0286	355.59
2.20	1.0697	-1.1469	0.8707	2.7317	0.0651	1.0227	-0.0853	1.0262	355.23
2.25	1.0749	-1.0916	0.8759	2.6310	0.0720	1.0192	-0.0914	1.0233	354.87
2.30	1.0801	-1.0401	0.8805	2.5334	0.0794	1.0151	-0.0972	1.0198	354.53
2.35	1.0853	-0.9922	0.8846	2.4393	0.0872	1.0106	-0.1027	1.0158	354.20
2.40	1.0905	-0.9477	0.8882	2.3487	0.0955	1.0056	-0.1078	1.0114	353.88
2.45	1.0956	-0.9062	0.8913	2.2618	0.1042	1.0003	-0.1124	1.0066	353.59
2.50	1.1005	-0.8675	0.8941	2.1786	0.1132	0.9947	-0.1165	1.0015	353.32
2.55	1.1053	-0.8314	0.8965	2.0993	0.1225	0.9888	-0.1202	0.9961	353.07
2.60	1.1099	-0.7977	0.8986	2.0237	0.1322	0.9829	-0.1233	0.9906	352.85
2.65	1.1143	-0.7663	0.9004	1.9518	0.1420	0.9768	-0.1260	0.9849	352.65
2.70	1.1185	-0.7369	0.9021	1.8836	0.1520	0.9708	-0.1282	0.9792	352.48
2.75	1.1225	-0.7093	0.9035	1.8189	0.1622	0.9648	-0.1300	0.9735	352.33
2.80	1.1262	-0.6835	0.9047	1.7575	0.1725	0.9589	-0.1313	0.9678	352.20
2.85	1.1297	-0.6593	0.9058	1.6994	0.1828	0.9531	-0.1323	0.9623	352.10
2.90	1.1330	-0.6366	0.9067	1.6443	0.1931	0.9475	-0.1330	0.9568	352.01
2.95	1.1360	-0.6152	0.9076	1.5922	0.2035	0.9420	-0.1333	0.9514	351.94
3.00	1.1388	-0.5951	0.9084	1.5428	0.2138	0.9367	-0.1334	0.9462	351.89
3.05	1.1414	-0.5762	0.9091	1.4959	0.2240	0.9316	-0.1333	0.9411	351.86
3.10	1.1438	-0.5583	0.9097	1.4516	0.2342	0.9267	-0.1329	0.9362	351.84
3.15	1.1460	-0.5414	0.9103	1.4095	0.2443	0.9220	-0.1324	0.9315	351.83
3.20	1.1480	-0.5254	0.9109	1.3696	0.2542	0.9175	-0.1318	0.9269	351.83
3.25	1.1498	-0.5103	0.9114	1.3317	0.2640	0.9132	-0.1310	0.9226	351.84
3.30	1.1514	-0.4960	0.9119	1.2957	0.2737	0.9091	-0.1301	0.9184	351.86
3.35	1.1529	-0.4824	0.9124	1.2615	0.2832	0.9052	-0.1291	0.9143	351.88
3.40	1.1542	-0.4695	0.9128	1.2290	0.2926	0.9014	-0.1280	0.9105	351.92
3.45	1.1554	-0.4572	0.9132	1.1980	0.3018	0.8979	-0.1269	0.9068	351.95
3.50	1.1565	-0.4456	0.9137	1.1686	0.3108	0.8944	-0.1258	0.9032	352.00
3.55	1.1574	-0.4345	0.9141	1.1405	0.3197	0.8912	-0.1246	0.8998	352.04
3.60	1.1582	-0.4239	0.9145	1.1137	0.3283	0.8881	-0.1234	0.8966	352.09
3.65	1.1589	-0.4138	0.9149	1.0881	0.3369	0.8851	-0.1221	0.8935	352.14
3.70	1.1594	-0.4041	0.9153	1.0637	0.3452	0.8822	-0.1209	0.8905	352.20
3.75	1.1599	-0.3949	0.9157	1.0403	0.3533	0.8795	-0.1197	0.8876	352.25
3.80	1.1603	-0.3861	0.9161	1.0180	0.3613	0.8769	-0.1184	0.8848	352.31
3.85	1.1606	-0.3777	0.9165	0.9966	0.3691	0.8744	-0.1172	0.8822	352.37
3.90	1.1608	-0.3696	0.9169	0.9761	0.3768	0.8720	-0.1159	0.8797	352.43
3.95	1.1610	-0.3619	0.9173	0.9565	0.3842	0.8697	-0.1147	0.8772	352.48

$k =$ 0.2				$\sigma =$ 0.50				
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0050	0.0014	0.0052	164.23	0.0155	0.1235	0.1245	82.82
1.05	-0.0060	0.0019	0.0062	162.61	0.0189	0.1358	0.1371	82.09
1.10	-0.0071	0.0025	0.0075	160.91	0.0227	0.1486	0.1503	81.31
1.15	-0.0083	0.0032	0.0089	159.13	0.0271	0.1618	0.1641	80.50
1.20	-0.0097	0.0041	0.0105	157.27	0.0321	0.1755	0.1784	79.65
1.25	-0.0112	0.0052	0.0124	155.32	0.0377	0.1896	0.1933	78.76
1.30	-0.0129	0.0065	0.0144	153.30	0.0440	0.2039	0.2086	77.84
1.35	-0.0146	0.0080	0.0166	151.20	0.0510	0.2186	0.2245	76.87
1.40	-0.0164	0.0098	0.0191	149.02	0.0588	0.2336	0.2409	75.87
1.45	-0.0183	0.0120	0.0219	146.76	0.0674	0.2487	0.2577	74.83
1.50	-0.0202	0.0145	0.0248	144.41	0.0769	0.2639	0.2749	73.75
1.55	-0.0221	0.0173	0.0281	141.99	0.0873	0.2792	0.2925	72.64
1.60	-0.0240	0.0205	0.0315	139.49	0.0986	0.2944	0.3104	71.48
1.65	-0.0258	0.0241	0.0353	136.92	0.1109	0.3094	0.3287	70.29
1.70	-0.0274	0.0281	0.0393	134.27	0.1241	0.3243	0.3472	69.06
1.75	-0.0288	0.0325	0.0435	131.55	0.1383	0.3387	0.3659	67.79
1.80	-0.0300	0.0374	0.0479	128.76	0.1535	0.3528	0.3847	66.49
1.85	-0.0308	0.0426	0.0526	125.92	0.1696	0.3662	0.4036	65.15
1.90	-0.0313	0.0481	0.0574	123.01	0.1866	0.3790	0.4225	63.78
1.95	-0.0312	0.0540	0.0624	120.06	0.2045	0.3909	0.4412	62.38
2.00	-0.0307	0.0601	0.0675	117.06	0.2232	0.4020	0.4598	60.96
2.05	-0.0296	0.0664	0.0727	114.04	0.2425	0.4120	0.4781	59.51
2.10	-0.0279	0.0727	0.0779	110.99	0.2625	0.4209	0.4960	58.05
2.15	-0.0256	0.0791	0.0831	107.94	0.2828	0.4286	0.5135	56.58
2.20	-0.0227	0.0853	0.0883	104.89	0.3035	0.4351	0.5305	55.10
2.25	-0.0192	0.0914	0.0934	101.85	0.3243	0.4403	0.5468	53.62
2.30	-0.0151	0.0972	0.0984	98.85	0.3451	0.4442	0.5625	52.15
2.35	-0.0106	0.1027	0.1032	95.89	0.3658	0.4468	0.5775	50.69
2.40	-0.0056	0.1078	0.1079	92.99	0.3862	0.4483	0.5917	49.25
2.45	-0.0003	0.1124	0.1124	90.15	0.4062	0.4486	0.6052	47.84
2.50	0.0053	0.1165	0.1166	87.38	0.4257	0.4479	0.6179	46.46
2.55	0.0112	0.1202	0.1207	84.70	0.4445	0.4461	0.6298	45.10
2.60	0.0171	0.1233	0.1245	82.10	0.4627	0.4436	0.6410	43.79
2.65	0.0232	0.1260	0.1281	79.59	0.4801	0.4402	0.6514	42.52
2.70	0.0292	0.1282	0.1315	77.17	0.4968	0.4362	0.6611	41.29
2.75	0.0352	0.1300	0.1346	74.85	0.5127	0.4317	0.6702	40.10
2.80	0.0411	0.1313	0.1376	72.62	0.5278	0.4267	0.6787	38.96
2.85	0.0469	0.1323	0.1404	70.49	0.5421	0.4213	0.6866	37.86
2.90	0.0525	0.1330	0.1430	68.44	0.5557	0.4157	0.6939	36.80
2.95	0.0580	0.1333	0.1454	66.49	0.5685	0.4098	0.7008	35.79
3.00	0.0633	0.1334	0.1477	64.62	0.5806	0.4038	0.7072	34.82
3.05	0.0684	0.1333	0.1498	62.84	0.5920	0.3976	0.7132	33.89
3.10	0.0733	0.1329	0.1518	61.14	0.6028	0.3914	0.7188	33.00
3.15	0.0780	0.1324	0.1537	59.51	0.6130	0.3852	0.7240	32.14
3.20	0.0825	0.1318	0.1554	57.96	0.6226	0.3790	0.7289	31.33
3.25	0.0868	0.1310	0.1571	56.47	0.6317	0.3728	0.7335	30.55
3.30	0.0909	0.1301	0.1587	55.06	0.6403	0.3667	0.7379	29.80
3.35	0.0948	0.1291	0.1602	53.70	0.6484	0.3607	0.7420	29.09
3.40	0.0986	0.1280	0.1616	52.41	0.6561	0.3548	0.7459	28.40
3.45	0.1021	0.1269	0.1629	51.17	0.6634	0.3490	0.7496	27.75
3.50	0.1056	0.1258	0.1642	49.99	0.6703	0.3433	0.7531	27.12
3.55	0.1088	0.1246	0.1654	48.86	0.6768	0.3378	0.7564	26.52
3.60	0.1119	0.1234	0.1666	47.78	0.6830	0.3324	0.7596	25.95
3.65	0.1149	0.1221	0.1677	46.74	0.6889	0.3271	0.7626	25.40
3.70	0.1178	0.1209	0.1688	45.75	0.6946	0.3219	0.7655	24.87
3.75	0.1205	0.1197	0.1698	44.80	0.6999	0.3169	0.7683	24.36
3.80	0.1231	0.1184	0.1708	43.88	0.7051	0.3121	0.7710	23.88
3.85	0.1256	0.1172	0.1718	43.01	0.7099	0.3073	0.7736	23.41
3.90	0.1280	0.1159	0.1727	42.17	0.7146	0.3027	0.7761	22.96
3.95	0.1303	0.1147	0.1736	41.36	0.7191	0.2983	0.7785	22.53

$k = 0.2$ $\sigma = 0.50$									
a	$\frac{1-\sigma^2}{2} \cdot X$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	1.1610	-0.3544	0.9177	0.9377	0.3915	0.8675	-0.1135	0.8749	352.54
4.05	1.1610	-0.3473	0.9181	0.9196	0.3987	0.8653	-0.1123	0.8726	352.60
4.10	1.1610	-0.3404	0.9185	0.9022	0.4057	0.8633	-0.1112	0.8704	352.66
4.15	1.1609	-0.3338	0.9189	0.8855	0.4125	0.8613	-0.1100	0.8683	352.72
4.20	1.1607	-0.3275	0.9193	0.8695	0.4192	0.8594	-0.1089	0.8663	352.78
4.25	1.1605	-0.3214	0.9197	0.8540	0.4257	0.8576	-0.1078	0.8643	352.84
4.30	1.1602	-0.3155	0.9201	0.8391	0.4321	0.8558	-0.1067	0.8624	352.90
4.35	1.1599	-0.3098	0.9205	0.8247	0.4384	0.8541	-0.1056	0.8606	352.95
4.40	1.1595	-0.3043	0.9209	0.8108	0.4445	0.8524	-0.1045	0.8588	353.01
4.45	1.1592	-0.2991	0.9213	0.7975	0.4505	0.8508	-0.1035	0.8571	353.06
4.50	1.1587	-0.2939	0.9217	0.7845	0.4563	0.8493	-0.1025	0.8554	353.12
4.55	1.1583	-0.2890	0.9221	0.7720	0.4621	0.8477	-0.1015	0.8538	353.17
4.60	1.1578	-0.2842	0.9225	0.7599	0.4677	0.8463	-0.1005	0.8522	353.23
4.65	1.1573	-0.2796	0.9229	0.7482	0.4732	0.8449	-0.0995	0.8507	353.28
4.70	1.1568	-0.2751	0.9234	0.7369	0.4786	0.8435	-0.0986	0.8492	353.33
4.75	1.1562	-0.2708	0.9238	0.7259	0.4839	0.8421	-0.0977	0.8478	353.38
4.80	1.1556	-0.2666	0.9242	0.7152	0.4891	0.8408	-0.0968	0.8464	353.43
4.85	1.1550	-0.2625	0.9246	0.7049	0.4942	0.8395	-0.0959	0.8450	353.48
4.90	1.1544	-0.2585	0.9250	0.6949	0.4991	0.8383	-0.0950	0.8436	353.53
4.95	1.1538	-0.2547	0.9254	0.6851	0.5040	0.8371	-0.0942	0.8423	353.58
5.00	1.1532	-0.2509	0.9258	0.6757	0.5088	0.8359	-0.0933	0.8411	353.63
5.05	1.1525	-0.2473	0.9262	0.6665	0.5135	0.8347	-0.0925	0.8398	353.68
5.10	1.1519	-0.2437	0.9266	0.6575	0.5181	0.8336	-0.0917	0.8386	353.72
5.15	1.1512	-0.2403	0.9270	0.6488	0.5227	0.8325	-0.0909	0.8374	353.77
5.20	1.1505	-0.2370	0.9274	0.6403	0.5271	0.8314	-0.0901	0.8363	353.81
5.25	1.1498	-0.2337	0.9278	0.6321	0.5315	0.8303	-0.0894	0.8351	353.86
5.30	1.1491	-0.2305	0.9282	0.6240	0.5358	0.8293	-0.0886	0.8340	353.90
5.35	1.1484	-0.2274	0.9286	0.6162	0.5400	0.8283	-0.0879	0.8329	353.94
5.40	1.1477	-0.2244	0.9290	0.6085	0.5442	0.8273	-0.0872	0.8319	353.99
5.45	1.1470	-0.2215	0.9294	0.6010	0.5482	0.8263	-0.0864	0.8308	354.03
5.50	1.1463	-0.2186	0.9298	0.5937	0.5523	0.8253	-0.0857	0.8298	354.07
5.55	1.1456	-0.2158	0.9302	0.5866	0.5562	0.8244	-0.0850	0.8288	354.11
5.60	1.1449	-0.2131	0.9306	0.5797	0.5601	0.8235	-0.0844	0.8278	354.15
5.65	1.1442	-0.2104	0.9310	0.5729	0.5639	0.8226	-0.0837	0.8268	354.19
5.70	1.1435	-0.2078	0.9313	0.5663	0.5677	0.8217	-0.0830	0.8259	354.23
5.75	1.1428	-0.2053	0.9317	0.5598	0.5713	0.8209	-0.0824	0.8250	354.27
5.80	1.1421	-0.2028	0.9321	0.5534	0.5750	0.8200	-0.0817	0.8241	354.31
5.85	1.1414	-0.2003	0.9324	0.5472	0.5786	0.8192	-0.0811	0.8232	354.35
5.90	1.1407	-0.1980	0.9328	0.5411	0.5821	0.8184	-0.0805	0.8223	354.38
5.95	1.1400	-0.1956	0.9332	0.5352	0.5856	0.8176	-0.0799	0.8215	354.42
6.00	1.1394	-0.1934	0.9335	0.5294	0.5890	0.8168	-0.0793	0.8206	354.46
6.05	1.1387	-0.1911	0.9339	0.5237	0.5923	0.8160	-0.0787	0.8198	354.49
6.10	1.1380	-0.1890	0.9342	0.5181	0.5957	0.8152	-0.0781	0.8190	354.53
6.15	1.1373	-0.1868	0.9346	0.5126	0.5989	0.8145	-0.0775	0.8182	354.56
6.20	1.1366	-0.1847	0.9349	0.5073	0.6021	0.8138	-0.0769	0.8174	354.60
6.25	1.1360	-0.1827	0.9352	0.5020	0.6053	0.8130	-0.0764	0.8166	354.63
6.30	1.1353	-0.1807	0.9356	0.4969	0.6084	0.8123	-0.0758	0.8159	354.67
6.35	1.1346	-0.1787	0.9359	0.4918	0.6115	0.8116	-0.0753	0.8151	354.70
6.40	1.1340	-0.1768	0.9362	0.4869	0.6145	0.8110	-0.0747	0.8144	354.73
6.45	1.1333	-0.1749	0.9366	0.4820	0.6175	0.8103	-0.0742	0.8137	354.77
6.50	1.1327	-0.1731	0.9369	0.4773	0.6205	0.8096	-0.0737	0.8130	354.80
6.55	1.1320	-0.1713	0.9372	0.4726	0.6234	0.8090	-0.0732	0.8123	354.83
6.60	1.1314	-0.1695	0.9375	0.4680	0.6262	0.8083	-0.0726	0.8116	354.86
6.65	1.1308	-0.1677	0.9378	0.4635	0.6291	0.8077	-0.0721	0.8109	354.90
6.70	1.1302	-0.1660	0.9381	0.4591	0.6319	0.8071	-0.0716	0.8103	354.93
6.75	1.1295	-0.1644	0.9384	0.4548	0.6346	0.8065	-0.0711	0.8096	354.96
6.80	1.1289	-0.1627	0.9387	0.4505	0.6373	0.8059	-0.0707	0.8090	354.99
6.85	1.1283	-0.1611	0.9390	0.4463	0.6400	0.8053	-0.0702	0.8083	355.02
6.90	1.1277	-0.1595	0.9393	0.4422	0.6426	0.8047	-0.0697	0.8077	355.05
6.95	1.1271	-0.1580	0.9396	0.4382	0.6452	0.8041	-0.0692	0.8071	355.08

	$k = 0.2$		$\sigma = 0.50$					
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.1325	0.1135	0.1745	40.58	0.7234	0.2939	0.7809	22.11
4.05	0.1347	0.1123	0.1754	39.83	0.7276	0.2897	0.7831	21.71
4.10	0.1367	0.1112	0.1762	39.11	0.7316	0.2856	0.7853	21.32
4.15	0.1387	0.1100	0.1770	38.42	0.7354	0.2816	0.7875	20.95
4.20	0.1406	0.1089	0.1778	37.75	0.7391	0.2777	0.7896	20.60
4.25	0.1424	0.1078	0.1786	37.11	0.7427	0.2740	0.7916	20.25
4.30	0.1442	0.1067	0.1794	36.49	0.7461	0.2703	0.7936	19.92
4.35	0.1459	0.1056	0.1801	35.89	0.7495	0.2668	0.7955	19.60
4.40	0.1476	0.1045	0.1808	35.31	0.7527	0.2634	0.7974	19.28
4.45	0.1492	0.1035	0.1816	34.75	0.7558	0.2600	0.7993	18.98
4.50	0.1507	0.1025	0.1823	34.21	0.7589	0.2567	0.8011	18.69
4.55	0.1523	0.1015	0.1830	33.68	0.7618	0.2536	0.8029	18.41
4.60	0.1537	0.1005	0.1837	33.18	0.7647	0.2505	0.8047	18.14
4.65	0.1551	0.0995	0.1843	32.68	0.7675	0.2475	0.8064	17.87
4.70	0.1565	0.0986	0.1850	32.21	0.7702	0.2445	0.8081	17.62
4.75	0.1579	0.0977	0.1857	31.75	0.7728	0.2417	0.8097	17.37
4.80	0.1592	0.0968	0.1863	31.30	0.7754	0.2389	0.8114	17.12
4.85	0.1605	0.0959	0.1869	30.86	0.7779	0.2362	0.8130	16.89
4.90	0.1617	0.0950	0.1876	30.44	0.7804	0.2336	0.8146	16.66
4.95	0.1629	0.0942	0.1882	30.03	0.7828	0.2310	0.8161	16.44
5.00	0.1641	0.0933	0.1888	29.63	0.7851	0.2285	0.8177	16.22
5.05	0.1653	0.0925	0.1894	29.24	0.7874	0.2260	0.8192	16.01
5.10	0.1664	0.0917	0.1900	28.86	0.7896	0.2236	0.8207	15.81
5.15	0.1675	0.0909	0.1906	28.49	0.7918	0.2212	0.8222	15.61
5.20	0.1686	0.0901	0.1912	28.13	0.7940	0.2189	0.8236	15.42
5.25	0.1697	0.0894	0.1918	27.78	0.7961	0.2167	0.8250	15.23
5.30	0.1707	0.0886	0.1923	27.43	0.7981	0.2145	0.8264	15.04
5.35	0.1717	0.0879	0.1929	27.10	0.8001	0.2123	0.8278	14.86
5.40	0.1727	0.0872	0.1935	26.78	0.8021	0.2102	0.8292	14.69
5.45	0.1737	0.0864	0.1940	26.46	0.8041	0.2082	0.8306	14.51
5.50	0.1747	0.0857	0.1946	26.15	0.8059	0.2061	0.8319	14.35
5.55	0.1756	0.0850	0.1951	25.84	0.8078	0.2041	0.8332	14.18
5.60	0.1765	0.0844	0.1956	25.55	0.8096	0.2022	0.8345	14.02
5.65	0.1774	0.0837	0.1962	25.26	0.8114	0.2003	0.8358	13.87
5.70	0.1783	0.0830	0.1967	24.97	0.8132	0.1984	0.8370	13.71
5.75	0.1791	0.0824	0.1972	24.70	0.8149	0.1966	0.8383	13.56
5.80	0.1800	0.0817	0.1977	24.43	0.8166	0.1948	0.8395	13.41
5.85	0.1808	0.0811	0.1982	24.16	0.8183	0.1930	0.8407	13.27
5.90	0.1816	0.0805	0.1987	23.90	0.8199	0.1913	0.8419	13.13
5.95	0.1824	0.0799	0.1992	23.65	0.8215	0.1895	0.8431	12.99
6.00	0.1832	0.0793	0.1996	23.40	0.8231	0.1879	0.8442	12.86
6.05	0.1840	0.0787	0.2001	23.15	0.8246	0.1862	0.8454	12.72
6.10	0.1848	0.0781	0.2006	22.91	0.8261	0.1846	0.8465	12.60
6.15	0.1855	0.0775	0.2011	22.68	0.8276	0.1830	0.8476	12.47
6.20	0.1862	0.0769	0.2015	22.45	0.8291	0.1814	0.8487	12.34
6.25	0.1870	0.0764	0.2020	22.22	0.8305	0.1799	0.8498	12.22
6.30	0.1877	0.0758	0.2024	22.00	0.8320	0.1784	0.8509	12.10
6.35	0.1884	0.0753	0.2028	21.78	0.8334	0.1769	0.8519	11.98
6.40	0.1890	0.0747	0.2033	21.57	0.8347	0.1754	0.8530	11.87
6.45	0.1897	0.0742	0.2037	21.36	0.8361	0.1740	0.8540	11.75
6.50	0.1904	0.0737	0.2041	21.16	0.8374	0.1725	0.8550	11.64
6.55	0.1910	0.0732	0.2046	20.96	0.8387	0.1711	0.8560	11.53
6.60	0.1917	0.0726	0.2050	20.76	0.8400	0.1698	0.8570	11.43
6.65	0.1923	0.0721	0.2054	20.56	0.8413	0.1684	0.8580	11.32
6.70	0.1929	0.0716	0.2058	20.37	0.8425	0.1671	0.8589	11.22
6.75	0.1935	0.0711	0.2062	20.19	0.8437	0.1658	0.8599	11.12
6.80	0.1941	0.0707	0.2066	20.00	0.8449	0.1645	0.8608	11.02
6.85	0.1947	0.0702	0.2070	19.82	0.8461	0.1632	0.8617	10.92
6.90	0.1953	0.0697	0.2074	19.64	0.8473	0.1619	0.8626	10.82
6.95	0.1959	0.0692	0.2077	19.47	0.8484	0.1607	0.8635	10.73

a	$\frac{1-\sigma^2}{2}\cdot x$ REAL	$\frac{1-\sigma^2}{2}\cdot x$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
				$k = 0.2$	$\sigma = 0.50$				
7.00	1.1265	-0.1565	0.9399	0.4342	0.6478	0.8036	-0.0688	0.8065	355.11
7.05	1.1260	-0.1550	0.9402	0.4303	0.6503	0.8030	-0.0683	0.8059	355.14
7.10	1.1254	-0.1535	0.9405	0.4265	0.6528	0.8025	-0.0679	0.8053	355.17
7.15	1.1248	-0.1520	0.9408	0.4227	0.6553	0.8019	-0.0674	0.8048	355.19
7.20	1.1242	-0.1506	0.9410	0.4190	0.6577	0.8014	-0.0670	0.8042	355.22
7.25	1.1237	-0.1492	0.9413	0.4154	0.6601	0.8009	-0.0666	0.8037	355.25
7.30	1.1231	-0.1479	0.9416	0.4118	0.6624	0.8004	-0.0661	0.8031	355.28
7.35	1.1226	-0.1465	0.9418	0.4083	0.6648	0.7999	-0.0657	0.8026	355.30
7.40	1.1220	-0.1452	0.9421	0.4048	0.6671	0.7994	-0.0653	0.8020	355.33
7.45	1.1215	-0.1439	0.9424	0.4014	0.6694	0.7989	-0.0649	0.8015	355.36
7.50	1.1209	-0.1426	0.9426	0.3981	0.6716	0.7984	-0.0645	0.8010	355.38
7.55	1.1204	-0.1414	0.9429	0.3948	0.6738	0.7979	-0.0641	0.8005	355.41
7.60	1.1199	-0.1401	0.9431	0.3916	0.6760	0.7975	-0.0637	0.8000	355.44
7.65	1.1194	-0.1389	0.9434	0.3884	0.6782	0.7970	-0.0633	0.7995	355.46
7.70	1.1188	-0.1377	0.9436	0.3852	0.6803	0.7965	-0.0629	0.7990	355.49
7.75	1.1183	-0.1365	0.9439	0.3821	0.6824	0.7961	-0.0625	0.7985	355.51
7.80	1.1178	-0.1354	0.9441	0.3791	0.6845	0.7957	-0.0621	0.7981	355.54
7.85	1.1173	-0.1342	0.9443	0.3761	0.6865	0.7952	-0.0617	0.7976	355.56
7.90	1.1168	-0.1331	0.9446	0.3731	0.6886	0.7948	-0.0614	0.7971	355.59
7.95	1.1163	-0.1320	0.9448	0.3702	0.6906	0.7944	-0.0610	0.7967	355.61
8.00	1.1158	-0.1309	0.9450	0.3674	0.6925	0.7939	-0.0606	0.7962	355.63
8.05	1.1154	-0.1299	0.9453	0.3646	0.6945	0.7935	-0.0603	0.7958	355.66
8.10	1.1149	-0.1288	0.9455	0.3618	0.6964	0.7931	-0.0599	0.7954	355.68
8.15	1.1144	-0.1278	0.9457	0.3591	0.6983	0.7927	-0.0596	0.7949	355.70
8.20	1.1139	-0.1268	0.9460	0.3564	0.7002	0.7923	-0.0592	0.7945	355.73
8.25	1.1135	-0.1258	0.9462	0.3537	0.7021	0.7919	-0.0589	0.7941	355.75
8.30	1.1130	-0.1248	0.9464	0.3511	0.7039	0.7915	-0.0585	0.7937	355.77
8.35	1.1126	-0.1238	0.9466	0.3485	0.7057	0.7911	-0.0582	0.7933	355.79
8.40	1.1121	-0.1228	0.9468	0.3460	0.7075	0.7908	-0.0579	0.7929	355.81
8.45	1.1117	-0.1219	0.9470	0.3435	0.7093	0.7904	-0.0575	0.7925	355.84
8.50	1.1112	-0.1210	0.9472	0.3410	0.7111	0.7900	-0.0572	0.7921	355.86
8.55	1.1108	-0.1201	0.9474	0.3386	0.7128	0.7897	-0.0569	0.7917	355.88
8.60	1.1103	-0.1191	0.9476	0.3362	0.7145	0.7893	-0.0566	0.7913	355.90
8.65	1.1099	-0.1183	0.9479	0.3338	0.7162	0.7889	-0.0563	0.7910	355.92
8.70	1.1095	-0.1174	0.9481	0.3314	0.7179	0.7886	-0.0560	0.7906	355.94
8.75	1.1091	-0.1165	0.9483	0.3291	0.7195	0.7883	-0.0556	0.7902	355.96
8.80	1.1087	-0.1157	0.9484	0.3269	0.7212	0.7879	-0.0553	0.7899	355.98
8.85	1.1082	-0.1148	0.9486	0.3246	0.7228	0.7876	-0.0550	0.7895	356.00
8.90	1.1078	-0.1140	0.9488	0.3224	0.7244	0.7872	-0.0547	0.7891	356.02
8.95	1.1074	-0.1132	0.9490	0.3202	0.7260	0.7869	-0.0545	0.7888	356.04
9.00	1.1070	-0.1124	0.9492	0.3181	0.7275	0.7866	-0.0542	0.7884	356.06
9.05	1.1066	-0.1116	0.9494	0.3160	0.7291	0.7863	-0.0539	0.7881	356.08
9.10	1.1062	-0.1108	0.9496	0.3139	0.7306	0.7859	-0.0536	0.7878	356.10
9.15	1.1058	-0.1100	0.9498	0.3118	0.7321	0.7856	-0.0533	0.7874	356.12
9.20	1.1054	-0.1093	0.9500	0.3097	0.7336	0.7853	-0.0530	0.7871	356.14
9.25	1.1051	-0.1085	0.9501	0.3077	0.7351	0.7850	-0.0527	0.7868	356.16
9.30	1.1047	-0.1078	0.9503	0.3057	0.7366	0.7847	-0.0525	0.7865	356.17
9.35	1.1043	-0.1070	0.9505	0.3038	0.7380	0.7844	-0.0522	0.7861	356.19
9.40	1.1039	-0.1063	0.9507	0.3018	0.7395	0.7841	-0.0519	0.7858	356.21
9.45	1.1035	-0.1056	0.9508	0.2999	0.7409	0.7838	-0.0517	0.7855	356.23
9.50	1.1032	-0.1049	0.9510	0.2980	0.7423	0.7835	-0.0514	0.7852	356.25
9.55	1.1028	-0.1042	0.9512	0.2961	0.7437	0.7832	-0.0511	0.7849	356.26
9.60	1.1024	-0.1035	0.9514	0.2943	0.7451	0.7829	-0.0509	0.7846	356.28
9.65	1.1021	-0.1028	0.9515	0.2925	0.7464	0.7827	-0.0506	0.7843	356.30
9.70	1.1017	-0.1022	0.9517	0.2907	0.7478	0.7824	-0.0504	0.7840	356.32
9.75	1.1014	-0.1015	0.9519	0.2889	0.7491	0.7821	-0.0501	0.7837	356.33
9.80	1.1010	-0.1008	0.9520	0.2871	0.7504	0.7818	-0.0499	0.7834	356.35
9.85	1.1007	-0.1002	0.9522	0.2854	0.7517	0.7816	-0.0496	0.7831	356.37
9.90	1.1003	-0.0996	0.9523	0.2837	0.7530	0.7813	-0.0494	0.7829	356.38
9.95	1.1000	-0.0989	0.9525	0.2820	0.7543	0.7810	-0.0492	0.7826	356.40
10.00	1.0997	-0.0983	0.9527	0.2803	0.7556	0.7808	-0.0489	0.7823	356.41

k = 0.2				σ = 0.50				
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.1964	0.0688	0.2081	19.30	0.8496	0.1595	0.8644	10.63
7.05	0.1970	0.0683	0.2085	19.13	0.8507	0.1583	0.8653	10.54
7.10	0.1975	0.0679	0.2089	18.96	0.8518	0.1571	0.8662	10.45
7.15	0.1981	0.0674	0.2092	18.80	0.8529	0.1559	0.8670	10.36
7.20	0.1986	0.0670	0.2096	18.64	0.8539	0.1548	0.8679	10.27
7.25	0.1991	0.0666	0.2099	18.48	0.8550	0.1537	0.8687	10.19
7.30	0.1996	0.0661	0.2103	18.33	0.8560	0.1525	0.8695	10.10
7.35	0.2001	0.0657	0.2106	18.17	0.8570	0.1514	0.8703	10.02
7.40	0.2006	0.0653	0.2110	18.02	0.8581	0.1504	0.8711	9.94
7.45	0.2011	0.0649	0.2113	17.88	0.8590	0.1493	0.8719	9.86
7.50	0.2016	0.0645	0.2116	17.73	0.8600	0.1482	0.8727	9.78
7.55	0.2021	0.0641	0.2120	17.59	0.8610	0.1472	0.8735	9.70
7.60	0.2025	0.0637	0.2123	17.45	0.8619	0.1462	0.8742	9.62
7.65	0.2030	0.0633	0.2126	17.31	0.8629	0.1451	0.8750	9.55
7.70	0.2035	0.0629	0.2129	17.17	0.8638	0.1441	0.8757	9.47
7.75	0.2039	0.0625	0.2133	17.04	0.8647	0.1432	0.8765	9.40
7.80	0.2043	0.0621	0.2136	16.90	0.8656	0.1422	0.8772	9.33
7.85	0.2048	0.0617	0.2139	16.77	0.8665	0.1412	0.8779	9.26
7.90	0.2052	0.0614	0.2142	16.65	0.8674	0.1403	0.8786	9.19
7.95	0.2056	0.0610	0.2145	16.52	0.8682	0.1393	0.8793	9.12
8.00	0.2061	0.0606	0.2148	16.39	0.8691	0.1384	0.8800	9.05
8.05	0.2065	0.0603	0.2151	16.27	0.8699	0.1375	0.8807	8.98
8.10	0.2069	0.0599	0.2154	16.15	0.8707	0.1366	0.8814	8.92
8.15	0.2073	0.0596	0.2157	16.03	0.8716	0.1357	0.8821	8.85
8.20	0.2077	0.0592	0.2160	15.91	0.8724	0.1349	0.8827	8.79
8.25	0.2081	0.0589	0.2162	15.80	0.8732	0.1340	0.8834	8.72
8.30	0.2085	0.0585	0.2165	15.68	0.8739	0.1331	0.8840	8.66
8.35	0.2089	0.0582	0.2168	15.57	0.8747	0.1323	0.8847	8.60
8.40	0.2092	0.0579	0.2171	15.46	0.8755	0.1315	0.8853	8.54
8.45	0.2096	0.0575	0.2174	15.35	0.8763	0.1306	0.8859	8.48
8.50	0.2100	0.0572	0.2176	15.24	0.8770	0.1298	0.8866	8.42
8.55	0.2103	0.0569	0.2179	15.14	0.8777	0.1290	0.8872	8.36
8.60	0.2107	0.0566	0.2182	15.03	0.8785	0.1282	0.8878	8.31
8.65	0.2111	0.0563	0.2184	14.93	0.8792	0.1275	0.8884	8.25
8.70	0.2114	0.0560	0.2187	14.83	0.8799	0.1267	0.8890	8.19
8.75	0.2117	0.0556	0.2189	14.72	0.8806	0.1259	0.8896	8.14
8.80	0.2121	0.0553	0.2192	14.62	0.8813	0.1252	0.8901	8.08
8.85	0.2124	0.0550	0.2194	14.53	0.8820	0.1244	0.8907	8.03
8.90	0.2128	0.0547	0.2197	14.43	0.8827	0.1237	0.8913	7.98
8.95	0.2131	0.0545	0.2199	14.33	0.8833	0.1229	0.8919	7.92
9.00	0.2134	0.0542	0.2202	14.24	0.8840	0.1222	0.8924	7.87
9.05	0.2137	0.0539	0.2204	14.15	0.8847	0.1215	0.8930	7.82
9.10	0.2141	0.0536	0.2207	14.05	0.8853	0.1208	0.8935	7.77
9.15	0.2144	0.0533	0.2209	13.96	0.8860	0.1201	0.8941	7.72
9.20	0.2147	0.0530	0.2211	13.87	0.8866	0.1194	0.8946	7.67
9.25	0.2150	0.0527	0.2214	13.79	0.8872	0.1188	0.8951	7.62
9.30	0.2153	0.0525	0.2216	13.70	0.8878	0.1181	0.8957	7.58
9.35	0.2156	0.0522	0.2218	13.61	0.8884	0.1174	0.8962	7.53
9.40	0.2159	0.0519	0.2221	13.53	0.8891	0.1168	0.8967	7.48
9.45	0.2162	0.0517	0.2223	13.44	0.8897	0.1161	0.8972	7.44
9.50	0.2165	0.0514	0.2225	13.36	0.8902	0.1155	0.8977	7.39
9.55	0.2168	0.0511	0.2227	13.28	0.8908	0.1148	0.8982	7.34
9.60	0.2171	0.0509	0.2229	13.20	0.8914	0.1142	0.8987	7.30
9.65	0.2173	0.0506	0.2232	13.11	0.8920	0.1136	0.8992	7.26
9.70	0.2176	0.0504	0.2234	13.04	0.8926	0.1130	0.8997	7.21
9.75	0.2179	0.0501	0.2236	12.96	0.8931	0.1124	0.9002	7.17
9.80	0.2182	0.0499	0.2238	12.88	0.8937	0.1117	0.9006	7.13
9.85	0.2184	0.0496	0.2240	12.80	0.8942	0.1112	0.9011	7.09
9.90	0.2187	0.0494	0.2242	12.73	0.8948	0.1106	0.9016	7.04
9.95	0.2190	0.0492	0.2244	12.65	0.8953	0.1100	0.9020	7.00
10.00	0.2192	0.0489	0.2246	12.58	0.8958	0.1094	0.9025	6.96

$k = 0.3$						$\sigma = 0.00$			
a	$\frac{1-\sigma^2}{2} \cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.2474	-9.9972	0.4203	5.5479	0.0039	1.0051	0.0241	1.0054	1.38
1.05	1.2476	-9.0672	0.4385	5.4778	0.0042	1.0062	0.0264	1.0065	1.50
1.10	1.2478	-8.2611	0.4564	5.4054	0.0045	1.0074	0.0287	1.0078	1.63
1.15	1.2480	-7.5578	0.4738	5.3307	0.0048	1.0088	0.0311	1.0093	1.77
1.20	1.2483	-6.9406	0.4909	5.2540	0.0052	1.0103	0.0335	1.0109	1.90
1.25	1.2485	-6.3958	0.5075	5.1752	0.0057	1.0120	0.0359	1.0127	2.03
1.30	1.2488	-5.9127	0.5237	5.0947	0.0061	1.0140	0.0382	1.0147	2.16
1.35	1.2492	-5.4822	0.5395	5.0125	0.0067	1.0160	0.0406	1.0169	2.29
1.40	1.2496	-5.0970	0.5548	4.9289	0.0072	1.0183	0.0429	1.0192	2.41
1.45	1.2500	-4.7510	0.5697	4.8439	0.0079	1.0208	0.0451	1.0218	2.53
1.50	1.2504	-4.4389	0.5841	4.7578	0.0086	1.0235	0.0472	1.0245	2.64
1.55	1.2509	-4.1566	0.5981	4.6706	0.0094	1.0263	0.0492	1.0275	2.74
1.60	1.2515	-3.9003	0.6116	4.5826	0.0102	1.0293	0.0510	1.0306	2.84
1.65	1.2521	-3.6669	0.6246	4.4940	0.0112	1.0325	0.0527	1.0338	2.92
1.70	1.2527	-3.4538	0.6371	4.4048	0.0122	1.0358	0.0542	1.0373	3.00
1.75	1.2534	-3.2588	0.6492	4.3153	0.0134	1.0393	0.0555	1.0408	3.06
1.80	1.2541	-3.0798	0.6609	4.2256	0.0146	1.0429	0.0566	1.0444	3.11
1.85	1.2549	-2.9152	0.6720	4.1359	0.0160	1.0466	0.0574	1.0482	3.14
1.90	1.2557	-2.7634	0.6827	4.0464	0.0175	1.0503	0.0580	1.0519	3.16
1.95	1.2565	-2.6232	0.6929	3.9572	0.0191	1.0541	0.0583	1.0558	3.17
2.00	1.2574	-2.4934	0.7027	3.8684	0.0209	1.0580	0.0583	1.0596	3.16
2.05	1.2583	-2.3731	0.7121	3.7802	0.0228	1.0618	0.0581	1.0634	3.13
2.10	1.2593	-2.2614	0.7210	3.6928	0.0249	1.0656	0.0576	1.0671	3.09
2.15	1.2603	-2.1574	0.7294	3.6063	0.0272	1.0693	0.0568	1.0708	3.04
2.20	1.2613	-2.0606	0.7375	3.5208	0.0296	1.0729	0.0558	1.0744	2.98
2.25	1.2623	-1.9702	0.7451	3.4365	0.0322	1.0764	0.0545	1.0778	2.90
2.30	1.2634	-1.8857	0.7524	3.3534	0.0350	1.0798	0.0530	1.0811	2.81
2.35	1.2645	-1.8068	0.7592	3.2718	0.0379	1.0830	0.0512	1.0842	2.71
2.40	1.2655	-1.7328	0.7657	3.1916	0.0411	1.0860	0.0493	1.0871	2.60
2.45	1.2666	-1.6634	0.7718	3.1130	0.0445	1.0888	0.0471	1.0898	2.48
2.50	1.2677	-1.5983	0.7776	3.0361	0.0480	1.0914	0.0448	1.0923	2.35
2.55	1.2687	-1.5371	0.7830	2.9610	0.0518	1.0938	0.0424	1.0946	2.22
2.60	1.2697	-1.4796	0.7882	2.8876	0.0557	1.0960	0.0399	1.0967	2.09
2.65	1.2707	-1.4254	0.7930	2.8161	0.0598	1.0979	0.0373	1.0985	1.95
2.70	1.2717	-1.3744	0.7976	2.7465	0.0642	1.0996	0.0346	1.1001	1.80
2.75	1.2726	-1.3262	0.8018	2.6788	0.0686	1.1011	0.0320	1.1015	1.66
2.80	1.2735	-1.2808	0.8059	2.6132	0.0733	1.1023	0.0293	1.1027	1.52
2.85	1.2743	-1.2379	0.8097	2.5494	0.0781	1.1033	0.0266	1.1037	1.38
2.90	1.2751	-1.1974	0.8132	2.4877	0.0831	1.1042	0.0239	1.1044	1.24
2.95	1.2758	-1.1590	0.8166	2.4279	0.0882	1.1048	0.0213	1.1050	1.10
3.00	1.2764	-1.1227	0.8197	2.3701	0.0935	1.1053	0.0187	1.1054	0.97
3.05	1.2769	-1.0883	0.8227	2.3142	0.0988	1.1056	0.0162	1.1057	0.84
3.10	1.2774	-1.0556	0.8255	2.2602	0.1043	1.1057	0.0138	1.1058	0.71
3.15	1.2778	-1.0247	0.8282	2.2081	0.1099	1.1057	0.0114	1.1058	0.59
3.20	1.2781	-0.9953	0.8307	2.1579	0.1156	1.1056	0.0091	1.1057	0.47
3.25	1.2784	-0.9674	0.8331	2.1094	0.1213	1.1054	0.0070	1.1054	0.36
3.30	1.2785	-0.9408	0.8354	2.0627	0.1271	1.1051	0.0049	1.1051	0.25
3.35	1.2786	-0.9156	0.8375	2.0177	0.1330	1.1046	0.0029	1.1047	0.15
3.40	1.2786	-0.8915	0.8396	1.9743	0.1389	1.1042	0.0010	1.1042	0.05
3.45	1.2785	-0.8686	0.8415	1.9326	0.1448	1.1036	-0.0008	1.1036	359.96
3.50	1.2783	-0.8468	0.8434	1.8923	0.1507	1.1030	-0.0025	1.1030	359.87
3.55	1.2780	-0.8260	0.8452	1.8536	0.1567	1.1023	-0.0041	1.1023	359.79
3.60	1.2777	-0.8061	0.8469	1.8163	0.1626	1.1016	-0.0057	1.1016	359.71
3.65	1.2773	-0.7871	0.8486	1.7804	0.1686	1.1009	-0.0071	1.1009	359.63
3.70	1.2768	-0.7689	0.8501	1.7458	0.1745	1.1001	-0.0085	1.1002	359.56
3.75	1.2762	-0.7515	0.8517	1.7125	0.1804	1.0993	-0.0098	1.0994	359.49
3.80	1.2756	-0.7348	0.8532	1.6804	0.1863	1.0985	-0.0110	1.0986	359.43
3.85	1.2749	-0.7189	0.8546	1.6494	0.1922	1.0977	-0.0121	1.0978	359.37
3.90	1.2741	-0.7036	0.8560	1.6196	0.1980	1.0969	-0.0132	1.0970	359.31
3.95	1.2733	-0.6889	0.8573	1.5909	0.2037	1.0961	-0.0142	1.0962	359.26

$k = 0.3$ $\sigma = 0.00$

Ω	$1+\eta$ REAL	$1+\eta$ IMAG.	$1+\eta$ MODULUS	$1+\eta$ PHASE (DEGREES)	$1+\eta F_{10}$ REAL	$1+\eta F_{10}$ IMAG.	$1+\eta F_{10}$ MODULUS	$1+\eta F_{10}$ PHASE (DEGREES)
1.00	-0.0051	-0.0241	0.0247	258.04	0.0123	0.0985	0.0993	82.89
1.05	-0.0062	-0.0264	0.0271	256.83	0.0149	0.1082	0.1093	82.17
1.10	-0.0074	-0.0287	0.0297	255.56	0.0179	0.1183	0.1197	81.41
1.15	-0.0088	-0.0311	0.0323	254.24	0.0213	0.1288	0.1305	80.62
1.20	-0.0103	-0.0335	0.0350	252.86	0.0251	0.1396	0.1418	79.80
1.25	-0.0120	-0.0359	0.0378	251.43	0.0294	0.1506	0.1535	78.95
1.30	-0.0140	-0.0382	0.0407	249.96	0.0342	0.1619	0.1655	78.07
1.35	-0.0160	-0.0406	0.0436	248.43	0.0395	0.1734	0.1778	77.16
1.40	-0.0183	-0.0429	0.0466	246.85	0.0454	0.1851	0.1906	76.23
1.45	-0.0208	-0.0451	0.0496	245.24	0.0518	0.1969	0.2036	75.26
1.50	-0.0235	-0.0472	0.0527	243.57	0.0588	0.2087	0.2168	74.27
1.55	-0.0263	-0.0492	0.0558	241.87	0.0664	0.2206	0.2304	73.25
1.60	-0.0293	-0.0510	0.0589	240.13	0.0746	0.2325	0.2441	72.21
1.65	-0.0325	-0.0527	0.0619	238.35	0.0834	0.2442	0.2581	71.15
1.70	-0.0358	-0.0542	0.0650	236.54	0.0928	0.2559	0.2722	70.06
1.75	-0.0393	-0.0555	0.0680	234.70	0.1028	0.2673	0.2864	68.96
1.80	-0.0429	-0.0566	0.0710	232.84	0.1134	0.2785	0.3007	67.84
1.85	-0.0466	-0.0574	0.0739	230.95	0.1246	0.2894	0.3151	66.71
1.90	-0.0503	-0.0580	0.0768	229.04	0.1363	0.2999	0.3295	65.56
1.95	-0.0541	-0.0583	0.0796	227.12	0.1485	0.3101	0.3438	64.41
2.00	-0.0580	-0.0583	0.0823	225.19	0.1612	0.3197	0.3581	63.24
2.05	-0.0618	-0.0581	0.0848	223.24	0.1744	0.3289	0.3723	62.07
2.10	-0.0656	-0.0576	0.0873	221.30	0.1880	0.3375	0.3863	60.89
2.15	-0.0693	-0.0568	0.0896	219.36	0.2019	0.3456	0.4002	59.71
2.20	-0.0729	-0.0558	0.0918	217.42	0.2161	0.3530	0.4139	58.53
2.25	-0.0764	-0.0545	0.0939	215.49	0.2306	0.3598	0.4274	57.35
2.30	-0.0798	-0.0530	0.0958	213.57	0.2452	0.3660	0.4406	56.18
2.35	-0.0830	-0.0512	0.0975	211.67	0.2600	0.3715	0.4535	55.01
2.40	-0.0860	-0.0493	0.0991	209.80	0.2749	0.3764	0.4660	53.86
2.45	-0.0888	-0.0471	0.1005	207.95	0.2898	0.3805	0.4783	52.71
2.50	-0.0914	-0.0448	0.1018	206.12	0.3046	0.3841	0.4902	51.58
2.55	-0.0938	-0.0424	0.1030	204.33	0.3194	0.3870	0.5017	50.46
2.60	-0.0960	-0.0399	0.1039	202.58	0.3340	0.3892	0.5129	49.36
2.65	-0.0979	-0.0373	0.1048	200.86	0.3485	0.3909	0.5237	48.28
2.70	-0.0996	-0.0346	0.1054	199.18	0.3627	0.3920	0.5341	47.22
2.75	-0.1011	-0.0320	0.1060	197.55	0.3767	0.3926	0.5441	46.18
2.80	-0.1023	-0.0293	0.1064	195.96	0.3904	0.3926	0.5537	45.16
2.85	-0.1033	-0.0266	0.1067	194.42	0.4037	0.3922	0.5629	44.17
2.90	-0.1042	-0.0239	0.1069	192.92	0.4168	0.3914	0.5717	43.20
2.95	-0.1048	-0.0213	0.1069	191.47	0.4294	0.3901	0.5802	42.25
3.00	-0.1053	-0.0187	0.1069	190.07	0.4417	0.3885	0.5883	41.33
3.05	-0.1056	-0.0162	0.1068	188.72	0.4536	0.3866	0.5960	40.44
3.10	-0.1057	-0.0138	0.1066	187.41	0.4652	0.3844	0.6034	39.57
3.15	-0.1057	-0.0114	0.1063	186.15	0.4763	0.3819	0.6105	38.73
3.20	-0.1056	-0.0091	0.1060	184.94	0.4870	0.3793	0.6173	37.91
3.25	-0.1054	-0.0070	0.1056	183.78	0.4974	0.3764	0.6238	37.12
3.30	-0.1051	-0.0049	0.1052	182.66	0.5074	0.3734	0.6300	36.35
3.35	-0.1046	-0.0029	0.1047	181.58	0.5170	0.3702	0.6359	35.61
3.40	-0.1042	-0.0010	0.1042	180.55	0.5262	0.3669	0.6416	34.89
3.45	-0.1036	0.0008	0.1036	179.56	0.5351	0.3636	0.6470	34.19
3.50	-0.1030	0.0025	0.1030	178.60	0.5437	0.3602	0.6522	33.52
3.55	-0.1023	0.0041	0.1024	177.69	0.5519	0.3567	0.6572	32.87
3.60	-0.1016	0.0057	0.1018	176.81	0.5598	0.3532	0.6619	32.25
3.65	-0.1009	0.0071	0.1011	175.97	0.5675	0.3497	0.6665	31.64
3.70	-0.1001	0.0085	0.1005	175.16	0.5748	0.3461	0.6709	31.06
3.75	-0.0993	0.0098	0.0998	174.39	0.5818	0.3426	0.6752	30.49
3.80	-0.0985	0.0110	0.0992	173.64	0.5886	0.3391	0.6793	29.95
3.85	-0.0977	0.0121	0.0985	172.93	0.5951	0.3356	0.6833	29.42
3.90	-0.0969	0.0132	0.0978	172.24	0.6014	0.3321	0.6871	28.91
3.95	-0.0961	0.0142	0.0971	171.57	0.6075	0.3287	0.6908	28.42

$k = 0.3$ $\sigma = 0.00$

a	$\frac{1-\sigma^2}{2}\cdot X$ REAL	$\frac{1-\sigma^2}{2}\cdot X$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
4.00	1.2724	-0.6748	0.8587	1.5631	0.2095	1.0953	-0.0152	1.0954	359.21
4.05	1.2714	-0.6613	0.8599	1.5364	0.2152	1.0944	-0.0161	1.0945	359.16
4.10	1.2704	-0.6483	0.8612	1.5106	0.2208	1.0936	-0.0170	1.0937	359.11
4.15	1.2693	-0.6358	0.8624	1.4856	0.2264	1.0928	-0.0178	1.0929	359.07
4.20	1.2682	-0.6237	0.8636	1.4615	0.2319	1.0920	-0.0185	1.0921	359.03
4.25	1.2670	-0.6121	0.8648	1.4382	0.2373	1.0911	-0.0192	1.0913	358.99
4.30	1.2658	-0.6009	0.8660	1.4157	0.2428	1.0903	-0.0199	1.0905	358.95
4.35	1.2646	-0.5901	0.8671	1.3939	0.2481	1.0895	-0.0206	1.0897	358.92
4.40	1.2633	-0.5797	0.8682	1.3728	0.2534	1.0887	-0.0212	1.0890	358.89
4.45	1.2620	-0.5697	0.8693	1.3524	0.2586	1.0880	-0.0217	1.0882	358.86
4.50	1.2607	-0.5599	0.8704	1.3326	0.2638	1.0872	-0.0223	1.0874	358.83
4.55	1.2593	-0.5505	0.8714	1.3134	0.2689	1.0864	-0.0228	1.0867	358.80
4.60	1.2579	-0.5414	0.8725	1.2949	0.2739	1.0857	-0.0233	1.0859	358.77
4.65	1.2565	-0.5326	0.8735	1.2768	0.2789	1.0849	-0.0237	1.0852	358.75
4.70	1.2550	-0.5241	0.8745	1.2593	0.2839	1.0842	-0.0242	1.0845	358.72
4.75	1.2535	-0.5158	0.8755	1.2423	0.2887	1.0835	-0.0246	1.0838	358.70
4.80	1.2521	-0.5078	0.8765	1.2257	0.2935	1.0828	-0.0250	1.0831	358.68
4.85	1.2506	-0.5001	0.8775	1.2096	0.2983	1.0821	-0.0253	1.0824	358.66
4.90	1.2491	-0.4925	0.8785	1.1940	0.3030	1.0814	-0.0257	1.0817	358.64
4.95	1.2475	-0.4852	0.8794	1.1788	0.3077	1.0807	-0.0260	1.0810	358.62
5.00	1.2460	-0.4781	0.8803	1.1640	0.3122	1.0800	-0.0263	1.0803	358.60
5.05	1.2445	-0.4711	0.8813	1.1495	0.3168	1.0793	-0.0266	1.0797	358.59
5.10	1.2429	-0.4644	0.8822	1.1355	0.3213	1.0787	-0.0269	1.0790	358.57
5.15	1.2414	-0.4578	0.8831	1.1217	0.3257	1.0780	-0.0272	1.0784	358.56
5.20	1.2399	-0.4515	0.8840	1.1084	0.3301	1.0774	-0.0274	1.0777	358.54
5.25	1.2383	-0.4453	0.8849	1.0953	0.3344	1.0768	-0.0277	1.0771	358.53
5.30	1.2368	-0.4392	0.8857	1.0826	0.3387	1.0761	-0.0279	1.0765	358.52
5.35	1.2352	-0.4333	0.8866	1.0701	0.3430	1.0755	-0.0281	1.0759	358.50
5.40	1.2337	-0.4276	0.8875	1.0579	0.3472	1.0749	-0.0283	1.0753	358.49
5.45	1.2322	-0.4220	0.8883	1.0461	0.3513	1.0743	-0.0285	1.0747	358.48
5.50	1.2306	-0.4165	0.8891	1.0344	0.3554	1.0737	-0.0287	1.0741	358.47
5.55	1.2291	-0.4112	0.8900	1.0231	0.3595	1.0731	-0.0288	1.0735	358.46
5.60	1.2276	-0.4060	0.8908	1.0120	0.3635	1.0726	-0.0290	1.0730	358.45
5.65	1.2261	-0.4009	0.8916	1.0011	0.3675	1.0720	-0.0291	1.0724	358.44
5.70	1.2246	-0.3959	0.8924	0.9904	0.3714	1.0714	-0.0293	1.0718	358.43
5.75	1.2231	-0.3911	0.8931	0.9800	0.3753	1.0709	-0.0294	1.0713	358.43
5.80	1.2216	-0.3863	0.8939	0.9698	0.3792	1.0703	-0.0295	1.0707	358.42
5.85	1.2202	-0.3817	0.8947	0.9598	0.3830	1.0698	-0.0297	1.0702	358.41
5.90	1.2187	-0.3771	0.8954	0.9500	0.3868	1.0693	-0.0298	1.0697	358.41
5.95	1.2172	-0.3727	0.8962	0.9404	0.3905	1.0687	-0.0299	1.0691	358.40
6.00	1.2158	-0.3684	0.8969	0.9309	0.3942	1.0682	-0.0300	1.0686	358.39
6.05	1.2144	-0.3641	0.8976	0.9217	0.3978	1.0677	-0.0300	1.0681	358.39
6.10	1.2130	-0.3600	0.8983	0.9126	0.4015	1.0672	-0.0301	1.0676	358.38
6.15	1.2116	-0.3559	0.8991	0.9037	0.4051	1.0667	-0.0302	1.0671	358.38
6.20	1.2102	-0.3519	0.8997	0.8950	0.4086	1.0662	-0.0303	1.0666	358.37
6.25	1.2088	-0.3480	0.9004	0.8864	0.4121	1.0657	-0.0303	1.0661	358.37
6.30	1.2075	-0.3442	0.9011	0.8780	0.4156	1.0652	-0.0304	1.0657	358.37
6.35	1.2061	-0.3404	0.9018	0.8698	0.4190	1.0647	-0.0304	1.0652	358.36
6.40	1.2048	-0.3368	0.9025	0.8617	0.4225	1.0643	-0.0305	1.0647	358.36
6.45	1.2035	-0.3332	0.9031	0.8537	0.4258	1.0638	-0.0305	1.0643	358.36
6.50	1.2021	-0.3297	0.9038	0.8459	0.4292	1.0634	-0.0306	1.0638	358.35
6.55	1.2009	-0.3262	0.9044	0.8382	0.4325	1.0629	-0.0306	1.0633	358.35
6.60	1.1996	-0.3228	0.9050	0.8307	0.4358	1.0625	-0.0306	1.0629	358.35
6.65	1.1983	-0.3195	0.9056	0.8232	0.4390	1.0620	-0.0306	1.0625	358.35
6.70	1.1970	-0.3162	0.9063	0.8160	0.4422	1.0616	-0.0307	1.0620	358.35
6.75	1.1958	-0.3130	0.9069	0.8088	0.4454	1.0611	-0.0307	1.0616	358.34
6.80	1.1946	-0.3099	0.9075	0.8017	0.4485	1.0607	-0.0307	1.0612	358.34
6.85	1.1934	-0.3068	0.9081	0.7948	0.4517	1.0603	-0.0307	1.0607	358.34
6.90	1.1922	-0.3038	0.9086	0.7880	0.4548	1.0599	-0.0307	1.0603	358.34
6.95	1.1910	-0.3008	0.9092	0.7813	0.4578	1.0595	-0.0307	1.0599	358.34

$k = 0.3$				$\sigma = 0.00$				
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	-0.0953	0.0152	0.0965	170.94	0.6134	0.3253	0.6943	27.94
4.05	-0.0944	0.0161	0.0958	170.32	0.6191	0.3220	0.6978	27.48
4.10	-0.0936	0.0170	0.0951	169.73	0.6245	0.3187	0.7011	27.04
4.15	-0.0928	0.0178	0.0945	169.16	0.6298	0.3155	0.7044	26.61
4.20	-0.0920	0.0185	0.0938	168.61	0.6349	0.3123	0.7076	26.19
4.25	-0.0911	0.0192	0.0931	168.08	0.6399	0.3091	0.7107	25.79
4.30	-0.0903	0.0199	0.0925	167.56	0.6447	0.3061	0.7137	25.40
4.35	-0.0895	0.0206	0.0919	167.07	0.6494	0.3030	0.7166	25.02
4.40	-0.0887	0.0212	0.0912	166.58	0.6539	0.3001	0.7194	24.65
4.45	-0.0880	0.0217	0.0906	166.12	0.6583	0.2971	0.7222	24.29
4.50	-0.0872	0.0223	0.0900	165.67	0.6625	0.2943	0.7249	23.95
4.55	-0.0864	0.0228	0.0894	165.23	0.6667	0.2915	0.7276	23.61
4.60	-0.0857	0.0233	0.0888	164.80	0.6707	0.2887	0.7302	23.29
4.65	-0.0849	0.0237	0.0882	164.39	0.6746	0.2860	0.7328	22.97
4.70	-0.0842	0.0242	0.0876	163.99	0.6785	0.2833	0.7353	22.67
4.75	-0.0835	0.0246	0.0870	163.60	0.6822	0.2807	0.7377	22.37
4.80	-0.0828	0.0250	0.0865	163.22	0.6859	0.2782	0.7401	22.08
4.85	-0.0821	0.0253	0.0859	162.84	0.6894	0.2757	0.7425	21.79
4.90	-0.0814	0.0257	0.0853	162.48	0.6929	0.2732	0.7448	21.52
4.95	-0.0807	0.0260	0.0848	162.13	0.6963	0.2708	0.7471	21.25
5.00	-0.0800	0.0263	0.0842	161.79	0.6996	0.2684	0.7493	20.99
5.05	-0.0793	0.0266	0.0837	161.45	0.7028	0.2661	0.7515	20.74
5.10	-0.0787	0.0269	0.0832	161.12	0.7060	0.2638	0.7537	20.49
5.15	-0.0780	0.0272	0.0826	160.80	0.7091	0.2615	0.7558	20.24
5.20	-0.0774	0.0274	0.0821	160.49	0.7121	0.2593	0.7579	20.01
5.25	-0.0768	0.0277	0.0816	160.19	0.7151	0.2571	0.7599	19.78
5.30	-0.0761	0.0279	0.0811	159.89	0.7180	0.2550	0.7619	19.55
5.35	-0.0755	0.0281	0.0806	159.59	0.7209	0.2529	0.7639	19.33
5.40	-0.0749	0.0283	0.0801	159.31	0.7236	0.2508	0.7659	19.12
5.45	-0.0743	0.0285	0.0796	159.03	0.7264	0.2488	0.7678	18.90
5.50	-0.0737	0.0287	0.0791	158.75	0.7291	0.2468	0.7697	18.70
5.55	-0.0731	0.0288	0.0786	158.48	0.7317	0.2448	0.7716	18.50
5.60	-0.0726	0.0290	0.0781	158.22	0.7343	0.2428	0.7734	18.30
5.65	-0.0720	0.0291	0.0777	157.96	0.7368	0.2409	0.7752	18.11
5.70	-0.0714	0.0293	0.0772	157.71	0.7393	0.2390	0.7770	17.92
5.75	-0.0709	0.0294	0.0767	157.46	0.7418	0.2372	0.7788	17.73
5.80	-0.0703	0.0295	0.0763	157.21	0.7442	0.2353	0.7805	17.55
5.85	-0.0698	0.0297	0.0758	156.98	0.7465	0.2335	0.7822	17.37
5.90	-0.0693	0.0298	0.0754	156.74	0.7488	0.2317	0.7839	17.20
5.95	-0.0687	0.0299	0.0749	156.51	0.7511	0.2300	0.7855	17.02
6.00	-0.0682	0.0300	0.0745	156.29	0.7533	0.2282	0.7872	16.86
6.05	-0.0677	0.0300	0.0741	156.07	0.7555	0.2265	0.7888	16.69
6.10	-0.0672	0.0301	0.0736	155.85	0.7577	0.2249	0.7903	16.53
6.15	-0.0667	0.0302	0.0732	155.64	0.7598	0.2232	0.7919	16.37
6.20	-0.0662	0.0303	0.0728	155.43	0.7619	0.2215	0.7934	16.21
6.25	-0.0657	0.0303	0.0724	155.22	0.7639	0.2199	0.7950	16.06
6.30	-0.0652	0.0304	0.0720	155.02	0.7659	0.2183	0.7965	15.91
6.35	-0.0647	0.0304	0.0715	154.82	0.7679	0.2168	0.7979	15.76
6.40	-0.0643	0.0305	0.0711	154.63	0.7699	0.2152	0.7994	15.62
6.45	-0.0638	0.0305	0.0707	154.44	0.7718	0.2137	0.8008	15.48
6.50	-0.0634	0.0306	0.0703	154.25	0.7737	0.2122	0.8022	15.34
6.55	-0.0629	0.0306	0.0699	154.06	0.7755	0.2107	0.8036	15.20
6.60	-0.0625	0.0306	0.0696	153.88	0.7773	0.2092	0.8050	15.06
6.65	-0.0620	0.0306	0.0692	153.71	0.7791	0.2077	0.8063	14.93
6.70	-0.0616	0.0307	0.0688	153.53	0.7809	0.2063	0.8077	14.80
6.75	-0.0611	0.0307	0.0684	153.36	0.7826	0.2049	0.8090	14.67
6.80	-0.0607	0.0307	0.0680	153.19	0.7843	0.2035	0.8103	14.54
6.85	-0.0603	0.0307	0.0677	153.03	0.7860	0.2021	0.8116	14.42
6.90	-0.0599	0.0307	0.0673	152.86	0.7877	0.2007	0.8128	14.30
6.95	-0.0595	0.0307	0.0669	152.70	0.7893	0.1994	0.8141	14.18

$k = 0.3$						$\sigma = 0.00$			
a	$\frac{1-\sigma^2}{2} \cdot X$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	1.1898	-0.2979	0.9098	0.7747	0.4608	1.0591	-0.0307	1.0595	358.34
7.05	1.1886	-0.2951	0.9103	0.7682	0.4638	1.0587	-0.0307	1.0591	358.34
7.10	1.1875	-0.2923	0.9109	0.7618	0.4668	1.0583	-0.0307	1.0587	358.34
7.15	1.1863	-0.2895	0.9115	0.7556	0.4697	1.0579	-0.0307	1.0583	358.34
7.20	1.1852	-0.2868	0.9120	0.7494	0.4727	1.0575	-0.0306	1.0579	358.34
7.25	1.1841	-0.2841	0.9125	0.7433	0.4755	1.0571	-0.0306	1.0576	358.34
7.30	1.1830	-0.2815	0.9131	0.7373	0.4784	1.0567	-0.0306	1.0572	358.34
7.35	1.1819	-0.2789	0.9136	0.7314	0.4812	1.0564	-0.0306	1.0568	358.34
7.40	1.1808	-0.2764	0.9141	0.7256	0.4840	1.0560	-0.0306	1.0564	358.34
7.45	1.1797	-0.2739	0.9146	0.7199	0.4868	1.0556	-0.0305	1.0561	358.34
7.50	1.1787	-0.2715	0.9151	0.7143	0.4895	1.0553	-0.0305	1.0557	358.34
7.55	1.1776	-0.2691	0.9156	0.7087	0.4923	1.0549	-0.0305	1.0554	358.35
7.60	1.1766	-0.2667	0.9161	0.7033	0.4950	1.0546	-0.0304	1.0550	358.35
7.65	1.1756	-0.2644	0.9166	0.6979	0.4976	1.0542	-0.0304	1.0547	358.35
7.70	1.1746	-0.2621	0.9171	0.6926	0.5003	1.0539	-0.0304	1.0543	358.35
7.75	1.1736	-0.2599	0.9176	0.6874	0.5029	1.0536	-0.0303	1.0540	358.35
7.80	1.1726	-0.2577	0.9180	0.6822	0.5055	1.0532	-0.0303	1.0537	358.35
7.85	1.1716	-0.2555	0.9185	0.6772	0.5080	1.0529	-0.0303	1.0533	358.35
7.90	1.1706	-0.2534	0.9190	0.6722	0.5106	1.0526	-0.0302	1.0530	358.36
7.95	1.1696	-0.2513	0.9194	0.6673	0.5131	1.0522	-0.0302	1.0527	358.36
8.00	1.1687	-0.2492	0.9199	0.6624	0.5156	1.0519	-0.0301	1.0524	358.36
8.05	1.1677	-0.2472	0.9203	0.6576	0.5181	1.0516	-0.0301	1.0520	358.36
8.10	1.1668	-0.2451	0.9208	0.6529	0.5205	1.0513	-0.0300	1.0517	358.36
8.15	1.1659	-0.2432	0.9212	0.6483	0.5230	1.0510	-0.0300	1.0514	358.37
8.20	1.1650	-0.2412	0.9216	0.6437	0.5254	1.0507	-0.0299	1.0511	358.37
8.25	1.1641	-0.2393	0.9220	0.6392	0.5277	1.0504	-0.0299	1.0508	358.37
8.30	1.1632	-0.2374	0.9225	0.6347	0.5301	1.0501	-0.0298	1.0505	358.37
8.35	1.1623	-0.2356	0.9229	0.6303	0.5324	1.0498	-0.0298	1.0502	358.38
8.40	1.1614	-0.2337	0.9233	0.6260	0.5347	1.0495	-0.0297	1.0499	358.38
8.45	1.1605	-0.2319	0.9237	0.6217	0.5370	1.0492	-0.0297	1.0496	358.38
8.50	1.1597	-0.2301	0.9241	0.6175	0.5393	1.0489	-0.0296	1.0494	358.38
8.55	1.1588	-0.2284	0.9245	0.6133	0.5416	1.0487	-0.0296	1.0491	358.39
8.60	1.1580	-0.2267	0.9249	0.6092	0.5438	1.0484	-0.0295	1.0488	358.39
8.65	1.1571	-0.2250	0.9253	0.6051	0.5460	1.0481	-0.0294	1.0485	358.39
8.70	1.1563	-0.2233	0.9257	0.6011	0.5482	1.0478	-0.0294	1.0482	358.39
8.75	1.1555	-0.2216	0.9261	0.5972	0.5504	1.0476	-0.0293	1.0480	358.40
8.80	1.1547	-0.2200	0.9265	0.5933	0.5525	1.0473	-0.0293	1.0477	358.40
8.85	1.1539	-0.2184	0.9268	0.5894	0.5547	1.0470	-0.0292	1.0474	358.40
8.90	1.1531	-0.2168	0.9272	0.5856	0.5568	1.0468	-0.0291	1.0472	358.41
8.95	1.1523	-0.2153	0.9276	0.5818	0.5589	1.0465	-0.0291	1.0469	358.41
9.00	1.1515	-0.2137	0.9279	0.5781	0.5609	1.0463	-0.0290	1.0467	358.41
9.05	1.1508	-0.2122	0.9283	0.5745	0.5630	1.0460	-0.0290	1.0464	358.41
9.10	1.1500	-0.2107	0.9287	0.5709	0.5650	1.0458	-0.0289	1.0462	358.42
9.15	1.1492	-0.2092	0.9290	0.5673	0.5671	1.0455	-0.0288	1.0459	358.42
9.20	1.1485	-0.2078	0.9294	0.5638	0.5691	1.0453	-0.0288	1.0457	358.42
9.25	1.1477	-0.2063	0.9297	0.5603	0.5711	1.0450	-0.0287	1.0454	358.43
9.30	1.1470	-0.2049	0.9300	0.5568	0.5730	1.0448	-0.0286	1.0452	358.43
9.35	1.1463	-0.2035	0.9304	0.5534	0.5750	1.0445	-0.0286	1.0449	358.43
9.40	1.1455	-0.2021	0.9307	0.5501	0.5769	1.0443	-0.0285	1.0447	358.44
9.45	1.1448	-0.2008	0.9311	0.5468	0.5788	1.0441	-0.0284	1.0445	358.44
9.50	1.1441	-0.1994	0.9314	0.5435	0.5807	1.0439	-0.0284	1.0442	358.44
9.55	1.1434	-0.1981	0.9317	0.5402	0.5826	1.0436	-0.0283	1.0440	358.45
9.60	1.1427	-0.1968	0.9320	0.5370	0.5845	1.0434	-0.0283	1.0438	358.45
9.65	1.1420	-0.1955	0.9324	0.5339	0.5863	1.0432	-0.0282	1.0436	358.45
9.70	1.1414	-0.1942	0.9327	0.5307	0.5882	1.0430	-0.0281	1.0433	358.46
9.75	1.1407	-0.1929	0.9330	0.5276	0.5900	1.0427	-0.0281	1.0431	358.46
9.80	1.1400	-0.1917	0.9333	0.5246	0.5918	1.0425	-0.0280	1.0429	358.46
9.85	1.1393	-0.1905	0.9336	0.5215	0.5936	1.0423	-0.0279	1.0427	358.47
9.90	1.1387	-0.1892	0.9339	0.5186	0.5954	1.0421	-0.0279	1.0425	358.47
9.95	1.1380	-0.1880	0.9342	0.5156	0.5971	1.0419	-0.0278	1.0423	358.47
10.00	1.1374	-0.1869	0.9345	0.5127	0.5989	1.0417	-0.0277	1.0420	358.48

	$k = 0.3$ $\sigma = 0.00$							
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	-0.0591	0.0307	0.0666	152.54	0.7909	0.1980	0.8153	14.06
7.05	-0.0587	0.0307	0.0662	152.39	0.7925	0.1967	0.8165	13.94
7.10	-0.0583	0.0307	0.0659	152.24	0.7940	0.1954	0.8177	13.83
7.15	-0.0579	0.0307	0.0655	152.09	0.7956	0.1941	0.8189	13.71
7.20	-0.0575	0.0306	0.0652	151.94	0.7971	0.1929	0.8201	13.60
7.25	-0.0571	0.0306	0.0648	151.80	0.7986	0.1916	0.8212	13.49
7.30	-0.0567	0.0306	0.0645	151.65	0.8000	0.1904	0.8224	13.39
7.35	-0.0564	0.0306	0.0641	151.51	0.8015	0.1892	0.8235	13.28
7.40	-0.0560	0.0306	0.0638	151.38	0.8029	0.1879	0.8246	13.18
7.45	-0.0556	0.0305	0.0635	151.24	0.8043	0.1868	0.8257	13.07
7.50	-0.0553	0.0305	0.0631	151.11	0.8057	0.1856	0.8268	12.97
7.55	-0.0549	0.0305	0.0628	150.97	0.8070	0.1844	0.8278	12.87
7.60	-0.0546	0.0304	0.0625	150.84	0.8084	0.1833	0.8289	12.77
7.65	-0.0542	0.0304	0.0622	150.72	0.8097	0.1821	0.8299	12.68
7.70	-0.0539	0.0304	0.0619	150.59	0.8110	0.1810	0.8309	12.58
7.75	-0.0536	0.0303	0.0615	150.47	0.8123	0.1799	0.8320	12.49
7.80	-0.0532	0.0303	0.0612	150.35	0.8135	0.1788	0.8330	12.39
7.85	-0.0529	0.0303	0.0609	150.23	0.8148	0.1777	0.8340	12.30
7.90	-0.0526	0.0302	0.0606	150.11	0.8160	0.1766	0.8349	12.21
7.95	-0.0522	0.0302	0.0603	149.99	0.8173	0.1756	0.8359	12.12
8.00	-0.0519	0.0301	0.0600	149.88	0.8185	0.1745	0.8368	12.04
8.05	-0.0516	0.0301	0.0597	149.76	0.8196	0.1735	0.8378	11.95
8.10	-0.0513	0.0300	0.0594	149.65	0.8208	0.1724	0.8387	11.87
8.15	-0.0510	0.0300	0.0592	149.54	0.8220	0.1714	0.8396	11.78
8.20	-0.0507	0.0299	0.0589	149.44	0.8231	0.1704	0.8406	11.70
8.25	-0.0504	0.0299	0.0586	149.33	0.8242	0.1694	0.8415	11.62
8.30	-0.0501	0.0298	0.0583	149.22	0.8253	0.1685	0.8423	11.54
8.35	-0.0498	0.0298	0.0580	149.12	0.8264	0.1675	0.8432	11.46
8.40	-0.0495	0.0297	0.0577	149.02	0.8275	0.1665	0.8441	11.38
8.45	-0.0492	0.0297	0.0575	148.92	0.8286	0.1656	0.8450	11.30
8.50	-0.0489	0.0296	0.0572	148.82	0.8296	0.1646	0.8458	11.23
8.55	-0.0487	0.0296	0.0569	148.72	0.8307	0.1637	0.8467	11.15
8.60	-0.0484	0.0295	0.0567	148.62	0.8317	0.1628	0.8475	11.08
8.65	-0.0481	0.0294	0.0564	148.53	0.8327	0.1619	0.8483	11.00
8.70	-0.0478	0.0294	0.0561	148.44	0.8337	0.1610	0.8491	10.93
8.75	-0.0476	0.0293	0.0559	148.34	0.8347	0.1601	0.8499	10.86
8.80	-0.0473	0.0293	0.0556	148.25	0.8357	0.1592	0.8507	10.79
8.85	-0.0470	0.0292	0.0554	148.16	0.8367	0.1584	0.8515	10.72
8.90	-0.0468	0.0291	0.0551	148.07	0.8376	0.1575	0.8523	10.65
8.95	-0.0465	0.0291	0.0549	147.98	0.8386	0.1567	0.8531	10.58
9.00	-0.0463	0.0290	0.0546	147.90	0.8395	0.1558	0.8538	10.51
9.05	-0.0460	0.0290	0.0544	147.81	0.8404	0.1550	0.8546	10.45
9.10	-0.0458	0.0289	0.0541	147.73	0.8413	0.1542	0.8553	10.38
9.15	-0.0455	0.0288	0.0539	147.64	0.8422	0.1533	0.8561	10.32
9.20	-0.0453	0.0288	0.0536	147.56	0.8431	0.1525	0.8568	10.25
9.25	-0.0450	0.0287	0.0534	147.48	0.8440	0.1517	0.8575	10.19
9.30	-0.0448	0.0286	0.0532	147.40	0.8449	0.1509	0.8583	10.13
9.35	-0.0445	0.0286	0.0529	147.32	0.8457	0.1502	0.8590	10.07
9.40	-0.0443	0.0285	0.0527	147.24	0.8466	0.1494	0.8597	10.01
9.45	-0.0441	0.0284	0.0525	147.16	0.8474	0.1486	0.8604	9.95
9.50	-0.0439	0.0284	0.0522	147.09	0.8483	0.1478	0.8611	9.89
9.55	-0.0436	0.0283	0.0520	147.01	0.8491	0.1471	0.8617	9.83
9.60	-0.0434	0.0283	0.0518	146.94	0.8499	0.1464	0.8624	9.77
9.65	-0.0432	0.0282	0.0516	146.86	0.8507	0.1456	0.8631	9.71
9.70	-0.0430	0.0281	0.0513	146.79	0.8515	0.1449	0.8637	9.66
9.75	-0.0427	0.0281	0.0511	146.72	0.8523	0.1442	0.8644	9.60
9.80	-0.0425	0.0280	0.0509	146.65	0.8531	0.1434	0.8650	9.54
9.85	-0.0423	0.0279	0.0507	146.58	0.8538	0.1427	0.8657	9.49
9.90	-0.0421	0.0279	0.0505	146.51	0.8546	0.1420	0.8663	9.44
9.95	-0.0419	0.0278	0.0503	146.44	0.8554	0.1413	0.8670	9.38
10.00	-0.0417	0.0277	0.0501	146.37	0.8561	0.1406	0.8676	9.33

$k = 0.3$ $\qquad \sigma = 0.25$

a	$\frac{1-\sigma^2}{2}\cdot X$ REAL	$\frac{1-\sigma^2}{2}\cdot X$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
1.00	1.1098	-7.9883	0.4669	5.4706	0.0042	1.0051	0.0146	1.0052	0.83
1.05	1.1101	-7.2434	0.4868	5.3936	0.0045	1.0062	0.0159	1.0063	0.90
1.10	1.1105	-6.5975	0.5063	5.3140	0.0049	1.0074	0.0171	1.0076	0.97
1.15	1.1109	-6.0338	0.5254	5.2320	0.0053	1.0088	0.0184	1.0089	1.04
1.20	1.1114	-5.5389	0.5439	5.1477	0.0058	1.0103	0.0195	1.0105	1.11
1.25	1.1119	-5.1020	0.5619	5.0613	0.0063	1.0120	0.0207	1.0122	1.17
1.30	1.1125	-4.7144	0.5795	4.9730	0.0069	1.0138	0.0217	1.0141	1.23
1.35	1.1132	-4.3688	0.5965	4.8829	0.0076	1.0159	0.0226	1.0161	1.28
1.40	1.1140	-4.0594	0.6129	4.7913	0.0083	1.0181	0.0234	1.0183	1.32
1.45	1.1148	-3.7813	0.6289	4.6982	0.0091	1.0204	0.0241	1.0207	1.35
1.50	1.1157	-3.5304	0.6443	4.6038	0.0100	1.0229	0.0245	1.0232	1.37
1.55	1.1167	-3.3032	0.6591	4.5084	0.0110	1.0256	0.0248	1.0259	1.39
1.60	1.1178	-3.0968	0.6734	4.4120	0.0121	1.0284	0.0248	1.0287	1.38
1.65	1.1190	-2.9088	0.6872	4.3150	0.0134	1.0313	0.0246	1.0316	1.37
1.70	1.1203	-2.7370	0.7003	4.2173	0.0147	1.0342	0.0241	1.0345	1.34
1.75	1.1217	-2.5796	0.7130	4.1193	0.0163	1.0373	0.0233	1.0375	1.29
1.80	1.1232	-2.4351	0.7250	4.0212	0.0179	1.0403	0.0222	1.0406	1.23
1.85	1.1249	-2.3020	0.7365	3.9230	0.0198	1.0434	0.0208	1.0436	1.14
1.90	1.1266	-2.1792	0.7475	3.8249	0.0218	1.0464	0.0191	1.0466	1.05
1.95	1.1284	-2.0657	0.7578	3.7273	0.0241	1.0493	0.0170	1.0495	0.93
2.00	1.1304	-1.9606	0.7677	3.6302	0.0265	1.0521	0.0146	1.0522	0.80
2.05	1.1324	-1.8631	0.7770	3.5338	0.0292	1.0548	0.0119	1.0549	0.65
2.10	1.1346	-1.7725	0.7858	3.4382	0.0321	1.0572	0.0089	1.0573	0.48
2.15	1.1368	-1.6881	0.7940	3.3438	0.0353	1.0594	0.0056	1.0595	0.30
2.20	1.1392	-1.6095	0.8018	3.2506	0.0387	1.0614	0.0020	1.0614	0.11
2.25	1.1416	-1.5362	0.8090	3.1589	0.0425	1.0630	-0.0017	1.0630	359.91
2.30	1.1441	-1.4676	0.8158	3.0687	0.0465	1.0643	-0.0057	1.0643	359.69
2.35	1.1467	-1.4035	0.8221	2.9802	0.0508	1.0653	-0.0098	1.0653	359.47
2.40	1.1493	-1.3435	0.8280	2.8936	0.0554	1.0659	-0.0140	1.0660	359.25
2.45	1.1519	-1.2873	0.8334	2.8091	0.0603	1.0661	-0.0182	1.0663	359.02
2.50	1.1546	-1.2346	0.8385	2.7266	0.0654	1.0660	-0.0225	1.0662	358.79
2.55	1.1573	-1.1851	0.8431	2.6464	0.0709	1.0655	-0.0267	1.0659	358.56
2.60	1.1599	-1.1386	0.8474	2.5685	0.0766	1.0647	-0.0309	1.0652	358.34
2.65	1.1626	-1.0949	0.8513	2.4930	0.0827	1.0636	-0.0349	1.0641	358.12
2.70	1.1652	-1.0539	0.8549	2.4200	0.0889	1.0621	-0.0389	1.0628	357.90
2.75	1.1677	-1.0152	0.8583	2.3494	0.0954	1.0604	-0.0426	1.0613	357.70
2.80	1.1702	-0.9788	0.8613	2.2813	0.1021	1.0585	-0.0462	1.0595	357.50
2.85	1.1726	-0.9445	0.8641	2.2157	0.1091	1.0563	-0.0495	1.0575	357.32
2.90	1.1749	-0.9121	0.8667	2.1526	0.1162	1.0540	-0.0527	1.0553	357.14
2.95	1.1771	-0.8816	0.8691	2.0920	0.1234	1.0515	-0.0556	1.0530	356.97
3.00	1.1792	-0.8528	0.8713	2.0338	0.1308	1.0489	-0.0583	1.0505	356.82
3.05	1.1812	-0.8255	0.8733	1.9780	0.1383	1.0462	-0.0607	1.0479	356.68
3.10	1.1831	-0.7998	0.8752	1.9245	0.1460	1.0434	-0.0630	1.0453	356.55
3.15	1.1849	-0.7754	0.8769	1.8732	0.1536	1.0406	-0.0650	1.0426	356.42
3.20	1.1865	-0.7523	0.8785	1.8241	0.1614	1.0377	-0.0669	1.0399	356.31
3.25	1.1880	-0.7304	0.8800	1.7771	0.1691	1.0349	-0.0685	1.0372	356.21
3.30	1.1894	-0.7097	0.8814	1.7321	0.1769	1.0321	-0.0699	1.0344	356.12
3.35	1.1906	-0.6900	0.8827	1.6890	0.1847	1.0292	-0.0712	1.0317	356.04
3.40	1.1917	-0.6713	0.8840	1.6478	0.1925	1.0265	-0.0723	1.0290	355.97
3.45	1.1928	-0.6535	0.8851	1.6084	0.2002	1.0237	-0.0733	1.0264	355.90
3.50	1.1936	-0.6365	0.8862	1.5706	0.2079	1.0210	-0.0742	1.0237	355.85
3.55	1.1944	-0.6204	0.8873	1.5345	0.2156	1.0184	-0.0749	1.0212	355.79
3.60	1.1951	-0.6050	0.8883	1.4999	0.2232	1.0158	-0.0755	1.0186	355.75
3.65	1.1956	-0.5904	0.8893	1.4667	0.2307	1.0133	-0.0760	1.0162	355.71
3.70	1.1961	-0.5764	0.8902	1.4350	0.2381	1.0109	-0.0764	1.0138	355.68
3.75	1.1964	-0.5630	0.8911	1.4045	0.2455	1.0086	-0.0767	1.0114	355.65
3.80	1.1967	-0.5502	0.8920	1.3753	0.2528	1.0062	-0.0770	1.0091	355.63
3.85	1.1968	-0.5380	0.8928	1.3473	0.2599	1.0039	-0.0772	1.0069	355.61
3.90	1.1969	-0.5263	0.8936	1.3204	0.2670	1.0017	-0.0773	1.0047	355.59
3.95	1.1969	-0.5151	0.8944	1.2946	0.2740	0.9996	-0.0774	1.0026	355.58

$k = 0.3$ $\sigma = 0.25$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0051	-0.0146	0.0155	250.65	0.0134	0.1078	0.1087	82.90
1.05	-0.0062	-0.0159	0.0170	248.68	0.0163	0.1185	0.1196	82.18
1.10	-0.0074	-0.0171	0.0187	246.62	0.0196	0.1296	0.1311	81.42
1.15	-0.0088	-0.0184	0.0203	244.46	0.0233	0.1411	0.1430	80.63
1.20	-0.0103	-0.0195	0.0221	242.22	0.0275	0.1529	0.1554	79.81
1.25	-0.0120	-0.0207	0.0239	239.88	0.0322	0.1651	0.1682	78.95
1.30	-0.0138	-0.0217	0.0257	237.46	0.0375	0.1775	0.1814	78.06
1.35	-0.0159	-0.0226	0.0276	234.95	0.0434	0.1902	0.1951	77.14
1.40	-0.0181	-0.0234	0.0296	232.36	0.0499	0.2031	0.2091	76.19
1.45	-0.0204	-0.0241	0.0316	229.68	0.0570	0.2161	0.2235	75.21
1.50	-0.0229	-0.0245	0.0336	226.93	0.0648	0.2292	0.2382	74.20
1.55	-0.0256	-0.0248	0.0356	224.10	0.0733	0.2423	0.2532	73.17
1.60	-0.0284	-0.0248	0.0377	221.19	0.0825	0.2554	0.2684	72.10
1.65	-0.0313	-0.0246	0.0398	218.21	0.0924	0.2684	0.2839	71.01
1.70	-0.0342	-0.0241	0.0419	215.16	0.1030	0.2813	0.2996	69.90
1.75	-0.0373	-0.0233	0.0440	212.05	0.1143	0.2940	0.3154	68.76
1.80	-0.0403	-0.0222	0.0461	208.88	0.1263	0.3063	0.3313	67.60
1.85	-0.0434	-0.0208	0.0481	205.65	0.1389	0.3183	0.3473	66.42
1.90	-0.0464	-0.0191	0.0502	202.36	0.1523	0.3299	0.3634	65.22
1.95	-0.0493	-0.0170	0.0522	199.04	0.1663	0.3410	0.3794	64.01
2.00	-0.0521	-0.0146	0.0542	195.67	0.1808	0.3516	0.3953	62.78
2.05	-0.0548	-0.0119	0.0561	192.27	0.1959	0.3615	0.4112	61.54
2.10	-0.0572	-0.0089	0.0579	188.83	0.2115	0.3707	0.4269	60.29
2.15	-0.0594	-0.0056	0.0597	185.38	0.2276	0.3793	0.4423	59.03
2.20	-0.0614	-0.0020	0.0614	181.91	0.2440	0.3870	0.4575	57.77
2.25	-0.0630	0.0017	0.0630	178.43	0.2607	0.3940	0.4724	56.51
2.30	-0.0643	0.0057	0.0646	174.95	0.2776	0.4002	0.4870	55.25
2.35	-0.0653	0.0098	0.0660	171.48	0.2946	0.4055	0.5012	54.00
2.40	-0.0659	0.0140	0.0674	168.03	0.3117	0.4099	0.5150	52.75
2.45	-0.0661	0.0182	0.0686	164.59	0.3288	0.4135	0.5283	51.51
2.50	-0.0660	0.0225	0.0697	161.18	0.3458	0.4163	0.5412	50.28
2.55	-0.0655	0.0267	0.0708	157.81	0.3627	0.4183	0.5536	49.07
2.60	-0.0647	0.0309	0.0717	154.49	0.3793	0.4195	0.5655	47.88
2.65	-0.0636	0.0349	0.0725	151.21	0.3955	0.4199	0.5769	46.71
2.70	-0.0621	0.0389	0.0733	147.98	0.4115	0.4197	0.5878	45.57
2.75	-0.0604	0.0426	0.0739	144.81	0.4270	0.4188	0.5981	44.44
2.80	-0.0585	0.0462	0.0745	141.71	0.4421	0.4174	0.6080	43.35
2.85	-0.0563	0.0495	0.0750	138.67	0.4568	0.4153	0.6174	42.28
2.90	-0.0540	0.0527	0.0754	135.70	0.4709	0.4128	0.6262	41.24
2.95	-0.0515	0.0556	0.0758	132.81	0.4845	0.4099	0.6346	40.23
3.00	-0.0489	0.0583	0.0761	129.98	0.4976	0.4066	0.6426	39.26
3.05	-0.0462	0.0607	0.0763	127.24	0.5101	0.4030	0.6501	38.31
3.10	-0.0434	0.0630	0.0765	124.57	0.5222	0.3992	0.6573	37.39
3.15	-0.0406	0.0650	0.0767	121.97	0.5337	0.3950	0.6640	36.51
3.20	-0.0377	0.0669	0.0768	119.45	0.5447	0.3908	0.6704	35.66
3.25	-0.0349	0.0685	0.0769	117.00	0.5552	0.3863	0.6764	34.83
3.30	-0.0321	0.0699	0.0769	114.63	0.5652	0.3818	0.6821	34.04
3.35	-0.0292	0.0712	0.0770	112.33	0.5748	0.3772	0.6875	33.27
3.40	-0.0265	0.0723	0.0770	110.10	0.5840	0.3725	0.6927	32.54
3.45	-0.0237	0.0733	0.0771	107.93	0.5927	0.3679	0.6976	31.83
3.50	-0.0210	0.0742	0.0771	105.84	0.6010	0.3632	0.7022	31.14
3.55	-0.0184	0.0749	0.0771	103.81	0.6089	0.3585	0.7066	30.49
3.60	-0.0158	0.0755	0.0771	101.85	0.6165	0.3539	0.7108	29.86
3.65	-0.0133	0.0760	0.0771	99.94	0.6237	0.3493	0.7149	29.25
3.70	-0.0109	0.0764	0.0772	98.10	0.6307	0.3447	0.7187	28.66
3.75	-0.0085	0.0767	0.0772	96.31	0.6373	0.3403	0.7224	28.10
3.80	-0.0062	0.0770	0.0772	94.58	0.6436	0.3358	0.7260	27.56
3.85	-0.0039	0.0772	0.0773	92.90	0.6497	0.3315	0.7294	27.03
3.90	-0.0017	0.0773	0.0773	91.27	0.6555	0.3273	0.7326	26.53
3.95	0.0004	0.0774	0.0774	89.70	0.6611	0.3231	0.7358	26.05

	$k = 0.3$		$\sigma = 0.25$						
a	$\frac{1-\sigma^2}{2}\cdot X$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	1.1968	-0.5043	0.8952	1.2697	0.2809	0.9975	-0.0774	1.0005	355.56
4.05	1.1967	-0.4940	0.8960	1.2459	0.2877	0.9955	-0.0774	0.9985	355.56
4.10	1.1964	-0.4841	0.8967	1.2229	0.2944	0.9936	-0.0773	0.9966	355.55
4.15	1.1961	-0.4745	0.8975	1.2008	0.3010	0.9917	-0.0772	0.9947	355.55
4.20	1.1958	-0.4654	0.8982	1.1795	0.3074	0.9898	-0.0771	0.9928	355.55
4.25	1.1954	-0.4565	0.8989	1.1590	0.3138	0.9881	-0.0769	0.9910	355.55
4.30	1.1949	-0.4480	0.8997	1.1392	0.3201	0.9863	-0.0768	0.9893	355.55
4.35	1.1944	-0.4398	0.9004	1.1201	0.3262	0.9846	-0.0766	0.9876	355.55
4.40	1.1938	-0.4319	0.9011	1.1017	0.3323	0.9830	-0.0764	0.9860	355.56
4.45	1.1932	-0.4243	0.9017	1.0839	0.3383	0.9814	-0.0761	0.9843	355.56
4.50	1.1925	-0.4169	0.9024	1.0666	0.3442	0.9798	-0.0759	0.9828	355.57
4.55	1.1919	-0.4098	0.9031	1.0500	0.3499	0.9783	-0.0756	0.9813	355.58
4.60	1.1911	-0.4029	0.9038	1.0339	0.3556	0.9769	-0.0754	0.9798	355.59
4.65	1.1904	-0.3962	0.9044	1.0183	0.3612	0.9754	-0.0751	0.9783	355.60
4.70	1.1896	-0.3898	0.9051	1.0031	0.3667	0.9740	-0.0748	0.9769	355.61
4.75	1.1888	-0.3835	0.9058	0.9885	0.3721	0.9727	-0.0745	0.9755	355.62
4.80	1.1879	-0.3775	0.9064	0.9743	0.3775	0.9713	-0.0742	0.9742	355.63
4.85	1.1871	-0.3716	0.9070	0.9604	0.3827	0.9700	-0.0739	0.9728	355.64
4.90	1.1862	-0.3659	0.9077	0.9470	0.3879	0.9687	-0.0736	0.9715	355.65
4.95	1.1853	-0.3604	0.9083	0.9340	0.3930	0.9675	-0.0733	0.9703	355.67
5.00	1.1844	-0.3550	0.9089	0.9214	0.3980	0.9663	-0.0730	0.9690	355.68
5.05	1.1835	-0.3498	0.9096	0.9090	0.4029	0.9651	-0.0727	0.9678	355.69
5.10	1.1825	-0.3447	0.9102	0.8971	0.4078	0.9639	-0.0724	0.9666	355.71
5.15	1.1816	-0.3397	0.9108	0.8854	0.4126	0.9628	-0.0721	0.9655	355.72
5.20	1.1806	-0.3349	0.9114	0.8740	0.4173	0.9617	-0.0717	0.9643	355.73
5.25	1.1797	-0.3303	0.9120	0.8629	0.4219	0.9606	-0.0714	0.9632	355.75
5.30	1.1787	-0.3257	0.9126	0.8522	0.4265	0.9595	-0.0711	0.9621	355.76
5.35	1.1777	-0.3213	0.9132	0.8416	0.4310	0.9585	-0.0708	0.9611	355.78
5.40	1.1767	-0.3169	0.9137	0.8314	0.4355	0.9574	-0.0704	0.9600	355.79
5.45	1.1758	-0.3127	0.9143	0.8213	0.4398	0.9564	-0.0701	0.9590	355.81
5.50	1.1748	-0.3086	0.9149	0.8116	0.4442	0.9554	-0.0698	0.9580	355.82
5.55	1.1738	-0.3046	0.9155	0.8020	0.4484	0.9545	-0.0694	0.9570	355.84
5.60	1.1728	-0.3007	0.9160	0.7927	0.4526	0.9535	-0.0691	0.9560	355.85
5.65	1.1718	-0.2969	0.9166	0.7835	0.4568	0.9526	-0.0688	0.9551	355.87
5.70	1.1708	-0.2931	0.9171	0.7746	0.4609	0.9517	-0.0685	0.9541	355.89
5.75	1.1699	-0.2895	0.9177	0.7659	0.4649	0.9508	-0.0681	0.9532	355.90
5.80	1.1689	-0.2859	0.9182	0.7573	0.4689	0.9499	-0.0678	0.9523	355.92
5.85	1.1679	-0.2825	0.9187	0.7490	0.4728	0.9490	-0.0675	0.9514	355.93
5.90	1.1669	-0.2791	0.9193	0.7408	0.4767	0.9482	-0.0672	0.9505	355.95
5.95	1.1660	-0.2757	0.9198	0.7328	0.4806	0.9473	-0.0668	0.9497	355.96
6.00	1.1650	-0.2725	0.9203	0.7250	0.4843	0.9465	-0.0665	0.9488	355.98
6.05	1.1641	-0.2693	0.9208	0.7173	0.4881	0.9457	-0.0662	0.9480	356.00
6.10	1.1631	-0.2662	0.9213	0.7098	0.4918	0.9449	-0.0659	0.9472	356.01
6.15	1.1622	-0.2631	0.9218	0.7024	0.4954	0.9441	-0.0655	0.9464	356.03
6.20	1.1613	-0.2602	0.9223	0.6952	0.4990	0.9433	-0.0652	0.9456	356.05
6.25	1.1603	-0.2572	0.9228	0.6881	0.5025	0.9426	-0.0649	0.9448	356.06
6.30	1.1594	-0.2544	0.9232	0.6812	0.5060	0.9418	-0.0646	0.9440	356.08
6.35	1.1585	-0.2516	0.9237	0.6743	0.5095	0.9411	-0.0643	0.9433	356.09
6.40	1.1576	-0.2488	0.9242	0.6677	0.5129	0.9404	-0.0639	0.9426	356.11
6.45	1.1567	-0.2461	0.9246	0.6611	0.5163	0.9397	-0.0636	0.9418	356.13
6.50	1.1558	-0.2435	0.9251	0.6547	0.5196	0.9390	-0.0633	0.9411	356.14
6.55	1.1549	-0.2409	0.9255	0.6484	0.5229	0.9383	-0.0630	0.9404	356.16
6.60	1.1541	-0.2384	0.9260	0.6422	0.5261	0.9376	-0.0627	0.9397	356.18
6.65	1.1532	-0.2359	0.9264	0.6361	0.5294	0.9370	-0.0624	0.9390	356.19
6.70	1.1523	-0.2335	0.9269	0.6301	0.5325	0.9363	-0.0621	0.9384	356.21
6.75	1.1515	-0.2311	0.9273	0.6243	0.5357	0.9357	-0.0618	0.9377	356.22
6.80	1.1506	-0.2287	0.9277	0.6185	0.5388	0.9350	-0.0615	0.9370	356.24
6.85	1.1498	-0.2264	0.9281	0.6128	0.5418	0.9344	-0.0612	0.9364	356.26
6.90	1.1490	-0.2242	0.9286	0.6073	0.5448	0.9338	-0.0609	0.9358	356.27
6.95	1.1481	-0.2220	0.9290	0.6018	0.5478	0.9332	-0.0606	0.9352	356.29

$k = 0.3$ $\sigma = 0.25$

a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.0025	0.0774	0.0774	88.17	0.6664	0.3190	0.7389	25.58
4.05	0.0045	0.0774	0.0775	86.68	0.6716	0.3150	0.7418	25.13
4.10	0.0064	0.0773	0.0776	85.25	0.6766	0.3111	0.7447	24.69
4.15	0.0083	0.0772	0.0776	83.85	0.6814	0.3073	0.7474	24.27
4.20	0.0102	0.0771	0.0777	82.49	0.6860	0.3035	0.7501	23.87
4.25	0.0119	0.0769	0.0778	81.18	0.6904	0.2999	0.7527	23.48
4.30	0.0137	0.0768	0.0780	79.90	0.6947	0.2963	0.7553	23.10
4.35	0.0154	0.0766	0.0781	78.65	0.6989	0.2928	0.7577	22.73
4.40	0.0170	0.0764	0.0782	77.44	0.7029	0.2894	0.7602	22.38
4.45	0.0186	0.0761	0.0784	76.27	0.7068	0.2861	0.7625	22.04
4.50	0.0202	0.0759	0.0785	75.13	0.7106	0.2828	0.7648	21.70
4.55	0.0217	0.0756	0.0787	74.01	0.7143	0.2797	0.7671	21.38
4.60	0.0231	0.0754	0.0788	72.93	0.7178	0.2766	0.7693	21.07
4.65	0.0246	0.0751	0.0790	71.88	0.7213	0.2736	0.7714	20.77
4.70	0.0260	0.0748	0.0792	70.85	0.7247	0.2706	0.7735	20.48
4.75	0.0273	0.0745	0.0794	69.85	0.7280	0.2677	0.7756	20.19
4.80	0.0287	0.0742	0.0796	68.88	0.7311	0.2649	0.7777	19.91
4.85	0.0300	0.0739	0.0798	67.93	0.7343	0.2621	0.7796	19.65
4.90	0.0313	0.0736	0.0800	67.00	0.7373	0.2594	0.7816	19.38
4.95	0.0325	0.0733	0.0802	66.09	0.7403	0.2568	0.7835	19.13
5.00	0.0337	0.0730	0.0804	65.21	0.7432	0.2542	0.7854	18.88
5.05	0.0349	0.0727	0.0806	64.35	0.7460	0.2517	0.7873	18.64
5.10	0.0361	0.0724	0.0809	63.51	0.7487	0.2492	0.7891	18.41
5.15	0.0372	0.0721	0.0811	62.69	0.7514	0.2467	0.7909	18.18
5.20	0.0383	0.0717	0.0813	61.89	0.7541	0.2444	0.7927	17.95
5.25	0.0394	0.0714	0.0816	61.10	0.7567	0.2420	0.7944	17.74
5.30	0.0405	0.0711	0.0818	60.34	0.7592	0.2397	0.7961	17.52
5.35	0.0415	0.0708	0.0820	59.59	0.7617	0.2375	0.7978	17.32
5.40	0.0426	0.0704	0.0823	58.85	0.7641	0.2353	0.7995	17.12
5.45	0.0436	0.0701	0.0825	58.14	0.7665	0.2331	0.8011	16.92
5.50	0.0446	0.0698	0.0828	57.44	0.7688	0.2310	0.8027	16.72
5.55	0.0455	0.0694	0.0830	56.75	0.7711	0.2289	0.8043	16.54
5.60	0.0465	0.0691	0.0833	56.08	0.7733	0.2269	0.8059	16.35
5.65	0.0474	0.0688	0.0835	55.42	0.7755	0.2249	0.8074	16.17
5.70	0.0483	0.0685	0.0838	54.78	0.7776	0.2229	0.8090	15.99
5.75	0.0492	0.0681	0.0841	54.15	0.7798	0.2209	0.8104	15.82
5.80	0.0501	0.0678	0.0843	53.53	0.7818	0.2190	0.8119	15.65
5.85	0.0510	0.0675	0.0846	52.92	0.7839	0.2171	0.8134	15.48
5.90	0.0518	0.0672	0.0848	52.33	0.7858	0.2153	0.8148	15.32
5.95	0.0527	0.0668	0.0851	51.75	0.7878	0.2135	0.8162	15.16
6.00	0.0535	0.0665	0.0854	51.18	0.7897	0.2117	0.8176	15.01
6.05	0.0543	0.0662	0.0856	50.62	0.7916	0.2099	0.8190	14.85
6.10	0.0551	0.0659	0.0859	50.08	0.7935	0.2082	0.8203	14.70
6.15	0.0559	0.0655	0.0861	49.54	0.7953	0.2065	0.8216	14.56
6.20	0.0567	0.0652	0.0864	49.01	0.7971	0.2048	0.8230	14.41
6.25	0.0574	0.0649	0.0866	48.50	0.7988	0.2032	0.8243	14.27
6.30	0.0582	0.0646	0.0869	47.99	0.8005	0.2015	0.8255	14.13
6.35	0.0589	0.0643	0.0872	47.49	0.8022	0.1999	0.8268	13.99
6.40	0.0596	0.0639	0.0874	47.00	0.8039	0.1984	0.8280	13.86
6.45	0.0603	0.0636	0.0877	46.53	0.8055	0.1968	0.8292	13.73
6.50	0.0610	0.0633	0.0879	46.06	0.8072	0.1953	0.8304	13.60
6.55	0.0617	0.0630	0.0882	45.59	0.8087	0.1938	0.8316	13.47
6.60	0.0624	0.0627	0.0884	45.14	0.8103	0.1923	0.8328	13.35
6.65	0.0630	0.0624	0.0887	44.70	0.8118	0.1908	0.8340	13.23
6.70	0.0637	0.0621	0.0889	44.26	0.8133	0.1894	0.8351	13.11
6.75	0.0643	0.0618	0.0892	43.83	0.8148	0.1879	0.8362	12.99
6.80	0.0650	0.0615	0.0894	43.41	0.8163	0.1865	0.8373	12.87
6.85	0.0656	0.0612	0.0897	42.99	0.8177	0.1852	0.8384	12.76
6.90	0.0662	0.0609	0.0899	42.59	0.8191	0.1838	0.8395	12.65
6.95	0.0668	0.0606	0.0902	42.19	0.8205	0.1825	0.8406	12.54

		$k = 0.3$ $\sigma = 0.25$							
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	1.1473	-0.2198	0.9294	0.5964	0.5508	0.9326	-0.0603	0.9345	356.30
7.05	1.1465	-0.2177	0.9298	0.5912	0.5537	0.9320	-0.0600	0.9339	356.32
7.10	1.1457	-0.2156	0.9302	0.5860	0.5566	0.9314	-0.0597	0.9333	356.33
7.15	1.1449	-0.2135	0.9306	0.5809	0.5594	0.9309	-0.0594	0.9328	356.35
7.20	1.1442	-0.2115	0.9309	0.5758	0.5622	0.9303	-0.0591	0.9322	356.37
7.25	1.1434	-0.2095	0.9313	0.5709	0.5650	0.9297	-0.0588	0.9316	356.38
7.30	1.1426	-0.2076	0.9317	0.5661	0.5678	0.9292	-0.0585	0.9310	356.40
7.35	1.1419	-0.2057	0.9321	0.5613	0.5705	0.9287	-0.0582	0.9305	356.41
7.40	1.1411	-0.2038	0.9324	0.5566	0.5732	0.9281	-0.0579	0.9299	356.43
7.45	1.1404	-0.2019	0.9328	0.5520	0.5758	0.9276	-0.0577	0.9294	356.44
7.50	1.1396	-0.2001	0.9332	0.5474	0.5784	0.9271	-0.0574	0.9289	356.46
7.55	1.1389	-0.1983	0.9335	0.5430	0.5810	0.9266	-0.0571	0.9284	356.47
7.60	1.1382	-0.1966	0.9339	0.5386	0.5836	0.9261	-0.0568	0.9278	356.49
7.65	1.1375	-0.1948	0.9342	0.5342	0.5861	0.9256	-0.0566	0.9273	356.50
7.70	1.1368	-0.1931	0.9346	0.5300	0.5886	0.9251	-0.0563	0.9268	356.52
7.75	1.1360	-0.1915	0.9349	0.5258	0.5911	0.9246	-0.0560	0.9263	356.53
7.80	1.1354	-0.1898	0.9353	0.5216	0.5936	0.9242	-0.0558	0.9259	356.55
7.85	1.1347	-0.1882	0.9356	0.5176	0.5960	0.9237	-0.0555	0.9254	356.56
7.90	1.1340	-0.1866	0.9359	0.5135	0.5984	0.9233	-0.0552	0.9249	356.58
7.95	1.1333	-0.1851	0.9363	0.5096	0.6007	0.9228	-0.0550	0.9244	356.59
8.00	1.1326	-0.1835	0.9366	0.5057	0.6031	0.9224	-0.0547	0.9240	356.61
8.05	1.1320	-0.1820	0.9369	0.5019	0.6054	0.9219	-0.0544	0.9235	356.62
8.10	1.1313	-0.1805	0.9372	0.4981	0.6077	0.9215	-0.0542	0.9231	356.63
8.15	1.1307	-0.1790	0.9375	0.4944	0.6100	0.9210	-0.0539	0.9226	356.65
8.20	1.1300	-0.1776	0.9378	0.4907	0.6122	0.9206	-0.0537	0.9222	356.66
8.25	1.1294	-0.1762	0.9381	0.4871	0.6144	0.9202	-0.0534	0.9218	356.68
8.30	1.1288	-0.1748	0.9384	0.4835	0.6166	0.9198	-0.0532	0.9213	356.69
8.35	1.1281	-0.1734	0.9387	0.4800	0.6188	0.9194	-0.0529	0.9209	356.70
8.40	1.1275	-0.1720	0.9390	0.4766	0.6209	0.9190	-0.0527	0.9205	356.72
8.45	1.1269	-0.1707	0.9393	0.4731	0.6230	0.9186	-0.0525	0.9201	356.73
8.50	1.1263	-0.1694	0.9396	0.4698	0.6251	0.9182	-0.0522	0.9197	356.74
8.55	1.1257	-0.1681	0.9399	0.4665	0.6272	0.9178	-0.0520	0.9193	356.76
8.60	1.1251	-0.1668	0.9402	0.4632	0.6293	0.9174	-0.0517	0.9189	356.77
8.65	1.1245	-0.1655	0.9405	0.4600	0.6313	0.9170	-0.0515	0.9185	356.78
8.70	1.1239	-0.1643	0.9408	0.4568	0.6333	0.9167	-0.0513	0.9181	356.80
8.75	1.1233	-0.1631	0.9410	0.4536	0.6353	0.9163	-0.0510	0.9177	356.81
8.80	1.1228	-0.1618	0.9413	0.4505	0.6373	0.9159	-0.0508	0.9173	356.82
8.85	1.1222	-0.1607	0.9416	0.4475	0.6392	0.9156	-0.0506	0.9170	356.84
8.90	1.1216	-0.1595	0.9419	0.4444	0.6412	0.9152	-0.0504	0.9166	356.85
8.95	1.1211	-0.1583	0.9421	0.4415	0.6431	0.9149	-0.0501	0.9162	356.86
9.00	1.1205	-0.1572	0.9424	0.4385	0.6450	0.9145	-0.0499	0.9159	356.88
9.05	1.1200	-0.1561	0.9426	0.4356	0.6469	0.9142	-0.0497	0.9155	356.89
9.10	1.1194	-0.1549	0.9429	0.4328	0.6487	0.9138	-0.0495	0.9152	356.90
9.15	1.1189	-0.1538	0.9432	0.4299	0.6506	0.9135	-0.0493	0.9148	356.91
9.20	1.1184	-0.1528	0.9434	0.4271	0.6524	0.9132	-0.0491	0.9145	356.93
9.25	1.1178	-0.1517	0.9437	0.4244	0.6542	0.9128	-0.0488	0.9141	356.94
9.30	1.1173	-0.1506	0.9439	0.4217	0.6560	0.9125	-0.0486	0.9138	356.95
9.35	1.1168	-0.1496	0.9442	0.4190	0.6577	0.9122	-0.0484	0.9135	356.96
9.40	1.1163	-0.1486	0.9444	0.4163	0.6595	0.9119	-0.0482	0.9131	356.97
9.45	1.1158	-0.1476	0.9446	0.4137	0.6612	0.9116	-0.0480	0.9128	356.99
9.50	1.1153	-0.1466	0.9449	0.4111	0.6629	0.9112	-0.0478	0.9125	357.00
9.55	1.1148	-0.1456	0.9451	0.4086	0.6646	0.9109	-0.0476	0.9122	357.01
9.60	1.1143	-0.1446	0.9454	0.4060	0.6663	0.9106	-0.0474	0.9119	357.02
9.65	1.1138	-0.1437	0.9456	0.4035	0.6679	0.9103	-0.0472	0.9116	357.03
9.70	1.1133	-0.1427	0.9458	0.4011	0.6696	0.9100	-0.0470	0.9113	357.04
9.75	1.1128	-0.1418	0.9460	0.3986	0.6712	0.9097	-0.0468	0.9109	357.06
9.80	1.1123	-0.1409	0.9463	0.3962	0.6728	0.9095	-0.0466	0.9106	357.07
9.85	1.1119	-0.1399	0.9465	0.3939	0.6744	0.9092	-0.0464	0.9104	357.08
9.90	1.1114	-0.1390	0.9467	0.3915	0.6760	0.9089	-0.0462	0.9101	357.09
9.95	1.1109	-0.1382	0.9469	0.3892	0.6776	0.9086	-0.0460	0.9098	357.10
10.00	1.1105	-0.1373	0.9472	0.3869	0.6792	0.9083	-0.0458	0.9095	357.11

$k = 0.3$ $\sigma = 0.25$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.0674	0.0603	0.0904	41.80	0.8219	0.1811	0.8416	12.43
7.05	0.0680	0.0600	0.0907	41.41	0.8232	0.1798	0.8426	12.32
7.10	0.0686	0.0597	0.0909	41.03	0.8246	0.1785	0.8437	12.22
7.15	0.0691	0.0594	0.0911	40.66	0.8259	0.1773	0.8447	12.11
7.20	0.0697	0.0591	0.0914	40.29	0.8272	0.1760	0.8457	12.01
7.25	0.0703	0.0588	0.0916	39.93	0.8284	0.1748	0.8467	11.91
7.30	0.0708	0.0585	0.0918	39.57	0.8297	0.1735	0.8476	11.81
7.35	0.0713	0.0582	0.0921	39.23	0.8309	0.1723	0.8486	11.72
7.40	0.0719	0.0579	0.0923	38.88	0.8321	0.1711	0.8495	11.62
7.45	0.0724	0.0577	0.0925	38.54	0.8333	0.1700	0.8505	11.53
7.50	0.0729	0.0574	0.0928	38.21	0.8345	0.1688	0.8514	11.44
7.55	0.0734	0.0571	0.0930	37.89	0.8356	0.1677	0.8523	11.35
7.60	0.0739	0.0568	0.0932	37.56	0.8368	0.1665	0.8532	11.26
7.65	0.0744	0.0566	0.0935	37.25	0.8379	0.1654	0.8541	11.17
7.70	0.0749	0.0563	0.0937	36.94	0.8390	0.1643	0.8550	11.08
7.75	0.0754	0.0560	0.0939	36.63	0.8401	0.1633	0.8558	11.00
7.80	0.0758	0.0558	0.0941	36.33	0.8412	0.1622	0.8567	10.91
7.85	0.0763	0.0555	0.0943	36.03	0.8423	0.1611	0.8575	10.83
7.90	0.0767	0.0552	0.0946	35.74	0.8433	0.1601	0.8584	10.75
7.95	0.0772	0.0550	0.0948	35.45	0.8443	0.1590	0.8592	10.67
8.00	0.0776	0.0547	0.0950	35.17	0.8454	0.1580	0.8600	10.59
8.05	0.0781	0.0544	0.0952	34.89	0.8464	0.1570	0.8608	10.51
8.10	0.0785	0.0542	0.0954	34.61	0.8474	0.1560	0.8616	10.43
8.15	0.0790	0.0539	0.0956	34.34	0.8483	0.1551	0.8624	10.36
8.20	0.0794	0.0537	0.0958	34.07	0.8493	0.1541	0.8632	10.28
8.25	0.0798	0.0534	0.0960	33.81	0.8503	0.1531	0.8640	10.21
8.30	0.0802	0.0532	0.0962	33.55	0.8512	0.1522	0.8647	10.14
8.35	0.0806	0.0529	0.0965	33.30	0.8521	0.1512	0.8655	10.06
8.40	0.0810	0.0527	0.0967	33.04	0.8531	0.1503	0.8662	9.99
8.45	0.0814	0.0525	0.0969	32.80	0.8540	0.1494	0.8669	9.92
8.50	0.0818	0.0522	0.0971	32.55	0.8549	0.1485	0.8677	9.86
8.55	0.0822	0.0520	0.0973	32.31	0.8558	0.1476	0.8684	9.79
8.60	0.0826	0.0517	0.0975	32.07	0.8566	0.1467	0.8691	9.72
8.65	0.0830	0.0515	0.0977	31.84	0.8575	0.1459	0.8698	9.66
8.70	0.0833	0.0513	0.0978	31.61	0.8583	0.1450	0.8705	9.59
8.75	0.0837	0.0510	0.0980	31.38	0.8592	0.1442	0.8712	9.52
8.80	0.0841	0.0508	0.0982	31.15	0.8600	0.1433	0.8719	9.46
8.85	0.0844	0.0506	0.0984	30.93	0.8608	0.1425	0.8726	9.40
8.90	0.0848	0.0504	0.0986	30.71	0.8617	0.1417	0.8732	9.34
8.95	0.0851	0.0501	0.0988	30.50	0.8625	0.1409	0.8739	9.28
9.00	0.0855	0.0499	0.0990	30.28	0.8633	0.1401	0.8745	9.22
9.05	0.0858	0.0497	0.0992	30.07	0.8640	0.1393	0.8752	9.16
9.10	0.0862	0.0495	0.0994	29.87	0.8648	0.1385	0.8758	9.10
9.15	0.0865	0.0493	0.0996	29.66	0.8656	0.1377	0.8765	9.04
9.20	0.0868	0.0491	0.0997	29.46	0.8663	0.1369	0.8771	8.98
9.25	0.0872	0.0488	0.0999	29.26	0.8671	0.1362	0.8777	8.93
9.30	0.0875	0.0486	0.1001	29.06	0.8678	0.1354	0.8783	8.87
9.35	0.0878	0.0484	0.1003	28.87	0.8686	0.1347	0.8789	8.81
9.40	0.0881	0.0482	0.1005	28.68	0.8693	0.1339	0.8795	8.76
9.45	0.0884	0.0480	0.1006	28.49	0.8700	0.1332	0.8801	8.71
9.50	0.0888	0.0478	0.1008	28.30	0.8707	0.1325	0.8807	8.65
9.55	0.0891	0.0476	0.1010	28.12	0.8714	0.1318	0.8813	8.60
9.60	0.0894	0.0474	0.1012	27.94	0.8721	0.1311	0.8819	8.55
9.65	0.0897	0.0472	0.1013	27.76	0.8728	0.1304	0.8825	8.50
9.70	0.0900	0.0470	0.1015	27.58	0.8735	0.1297	0.8830	8.45
9.75	0.0903	0.0468	0.1017	27.40	0.8741	0.1290	0.8836	8.40
9.80	0.0905	0.0466	0.1018	27.23	0.8748	0.1283	0.8842	8.35
9.85	0.0908	0.0464	0.1020	27.06	0.8754	0.1277	0.8847	8.30
9.90	0.0911	0.0462	0.1022	26.89	0.8761	0.1270	0.8853	8.25
9.95	0.0914	0.0460	0.1023	26.72	0.8767	0.1264	0.8858	8.20
10.00	0.0917	0.0458	0.1025	26.56	0.8774	0.1257	0.8863	8.15

	$k = 0.3$			$\sigma = 0.50$					
a	$\frac{1-\sigma^2}{2} \cdot X$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.0030	-5.9741	0.5322	5.3163	0.0049	1.0050	-0.0014	1.0050	359.92
1.05	1.0036	-5.4137	0.5543	5.2254	0.0054	1.0060	-0.0018	1.0060	359.90
1.10	1.0043	-4.9275	0.5758	5.1317	0.0059	1.0071	-0.0024	1.0071	359.86
1.15	1.0052	-4.5028	0.5966	5.0352	0.0065	1.0084	-0.0031	1.0084	359.82
1.20	1.0062	-4.1297	0.6168	4.9361	0.0072	1.0098	-0.0040	1.0098	359.77
1.25	1.0073	-3.8000	0.6364	4.8347	0.0079	1.0113	-0.0050	1.0113	359.72
1.30	1.0085	-3.5072	0.6553	4.7310	0.0088	1.0130	-0.0063	1.0130	359.64
1.35	1.0099	-3.2458	0.6735	4.6253	0.0098	1.0148	-0.0078	1.0148	359.56
1.40	1.0115	-3.0116	0.6910	4.5178	0.0109	1.0166	-0.0096	1.0167	359.46
1.45	1.0132	-2.8008	0.7078	4.4086	0.0122	1.0186	-0.0117	1.0186	359.34
1.50	1.0152	-2.6103	0.7240	4.2980	0.0136	1.0206	-0.0141	1.0207	359.21
1.55	1.0173	-2.4375	0.7394	4.1861	0.0152	1.0226	-0.0169	1.0227	359.05
1.60	1.0197	-2.2804	0.7540	4.0732	0.0170	1.0246	-0.0201	1.0248	358.88
1.65	1.0223	-2.1370	0.7680	3.9594	0.0191	1.0265	-0.0237	1.0268	358.68
1.70	1.0251	-2.0058	0.7811	3.8450	0.0214	1.0283	-0.0277	1.0287	358.46
1.75	1.0282	-1.8854	0.7936	3.7303	0.0240	1.0299	-0.0321	1.0304	358.21
1.80	1.0316	-1.7747	0.8053	3.6154	0.0269	1.0313	-0.0370	1.0320	357.94
1.85	1.0352	-1.6727	0.8162	3.5006	0.0302	1.0324	-0.0423	1.0333	357.65
1.90	1.0391	-1.5785	0.8263	3.3863	0.0338	1.0331	-0.0480	1.0342	357.34
1.95	1.0433	-1.4914	0.8358	3.2726	0.0379	1.0333	-0.0540	1.0347	357.01
2.00	1.0477	-1.4107	0.8444	3.1601	0.0424	1.0331	-0.0603	1.0348	356.66
2.05	1.0524	-1.3358	0.8524	3.0489	0.0474	1.0322	-0.0668	1.0344	356.30
2.10	1.0573	-1.2663	0.8596	2.9394	0.0529	1.0308	-0.0735	1.0334	355.92
2.15	1.0623	-1.2018	0.8661	2.8320	0.0589	1.0287	-0.0802	1.0318	355.54
2.20	1.0676	-1.1418	0.8719	2.7270	0.0654	1.0259	-0.0869	1.0296	355.16
2.25	1.0730	-1.0860	0.8771	2.6248	0.0725	1.0225	-0.0934	1.0268	354.78
2.30	1.0785	-1.0341	0.8817	2.5256	0.0800	1.0186	-0.0998	1.0234	354.41
2.35	1.0840	-0.9858	0.8857	2.4298	0.0881	1.0140	-0.1057	1.0195	354.05
2.40	1.0895	-0.9409	0.8893	2.3375	0.0966	1.0089	-0.1113	1.0150	353.70
2.45	1.0950	-0.8990	0.8923	2.2489	0.1055	1.0034	-0.1164	1.0101	353.38
2.50	1.1003	-0.8600	0.8950	2.1641	0.1148	0.9976	-0.1210	1.0049	353.08
2.55	1.1055	-0.8236	0.8973	2.0833	0.1245	0.9915	-0.1251	0.9993	352.81
2.60	1.1106	-0.7897	0.8992	2.0062	0.1345	0.9852	-0.1287	0.9936	352.56
2.65	1.1154	-0.7581	0.9009	1.9331	0.1447	0.9788	-0.1317	0.9876	352.34
2.70	1.1201	-0.7285	0.9024	1.8637	0.1551	0.9724	-0.1342	0.9816	352.14
2.75	1.1245	-0.7009	0.9036	1.7979	0.1656	0.9660	-0.1362	0.9756	351.97
2.80	1.1286	-0.6750	0.9047	1.7356	0.1763	0.9597	-0.1378	0.9695	351.83
2.85	1.1325	-0.6508	0.9056	1.6767	0.1870	0.9535	-0.1389	0.9636	351.71
2.90	1.1362	-0.6281	0.9064	1.6210	0.1977	0.9475	-0.1397	0.9577	351.61
2.95	1.1396	-0.6067	0.9071	1.5683	0.2084	0.9416	-0.1401	0.9520	351.53
3.00	1.1428	-0.5866	0.9077	1.5185	0.2190	0.9360	-0.1403	0.9464	351.48
3.05	1.1457	-0.5677	0.9083	1.4713	0.2296	0.9305	-0.1402	0.9410	351.43
3.10	1.1484	-0.5499	0.9088	1.4267	0.2401	0.9253	-0.1399	0.9358	351.41
3.15	1.1509	-0.5331	0.9092	1.3844	0.2505	0.9203	-0.1393	0.9308	351.39
3.20	1.1532	-0.5172	0.9096	1.3444	0.2607	0.9155	-0.1386	0.9259	351.39
3.25	1.1553	-0.5022	0.9100	1.3065	0.2708	0.9109	-0.1378	0.9213	351.40
3.30	1.1572	-0.4879	0.9104	1.2705	0.2807	0.9065	-0.1368	0.9168	351.42
3.35	1.1590	-0.4744	0.9107	1.2363	0.2905	0.9023	-0.1358	0.9125	351.44
3.40	1.1605	-0.4616	0.9111	1.2038	0.3000	0.8983	-0.1347	0.9084	351.47
3.45	1.1619	-0.4495	0.9114	1.1730	0.3094	0.8945	-0.1335	0.9044	351.51
3.50	1.1632	-0.4379	0.9117	1.1436	0.3187	0.8909	-0.1323	0.9007	351.56
3.55	1.1643	-0.4269	0.9120	1.1157	0.3277	0.8874	-0.1310	0.8970	351.60
3.60	1.1653	-0.4164	0.9124	1.0890	0.3365	0.8841	-0.1297	0.8936	351.65
3.65	1.1661	-0.4065	0.9127	1.0636	0.3452	0.8810	-0.1284	0.8903	351.71
3.70	1.1669	-0.3969	0.9130	1.0394	0.3537	0.8780	-0.1271	0.8871	351.77
3.75	1.1675	-0.3878	0.9133	1.0162	0.3620	0.8751	-0.1257	0.8841	351.82
3.80	1.1680	-0.3791	0.9136	0.9941	0.3701	0.8723	-0.1244	0.8811	351.88
3.85	1.1685	-0.3708	0.9139	0.9729	0.3780	0.8697	-0.1231	0.8783	351.95
3.90	1.1688	-0.3628	0.9143	0.9526	0.3857	0.8671	-0.1218	0.8756	352.01
3.95	1.1691	-0.3551	0.9146	0.9332	0.3933	0.8647	-0.1205	0.8731	352.07

$k = 0.3$ $\sigma = 0.50$

α	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0050	0.0014	0.0052	164.71	0.0155	0.1235	0.1244	82.83
1.05	-0.0060	0.0018	0.0063	163.14	0.0188	0.1357	0.1371	82.10
1.10	-0.0071	0.0024	0.0075	161.49	0.0227	0.1485	0.1502	81.32
1.15	-0.0084	0.0031	0.0089	159.76	0.0270	0.1617	0.1640	80.51
1.20	-0.0098	0.0040	0.0106	157.96	0.0320	0.1754	0.1783	79.67
1.25	-0.0113	0.0050	0.0124	156.07	0.0376	0.1894	0.1931	78.79
1.30	-0.0130	0.0063	0.0144	154.11	0.0438	0.2038	0.2085	77.87
1.35	-0.0148	0.0078	0.0167	152.07	0.0508	0.2185	0.2243	76.91
1.40	-0.0166	0.0096	0.0192	149.96	0.0585	0.2334	0.2406	75.92
1.45	-0.0186	0.0117	0.0220	147.76	0.0671	0.2485	0.2574	74.89
1.50	-0.0206	0.0141	0.0250	145.49	0.0765	0.2637	0.2746	73.82
1.55	-0.0226	0.0169	0.0282	143.14	0.0868	0.2790	0.2922	72.72
1.60	-0.0246	0.0201	0.0318	140.71	0.0980	0.2942	0.3101	71.58
1.65	-0.0265	0.0237	0.0356	138.20	0.1101	0.3093	0.3283	70.40
1.70	-0.0283	0.0277	0.0396	135.62	0.1232	0.3242	0.3468	69.19
1.75	-0.0299	0.0321	0.0439	132.97	0.1373	0.3387	0.3655	67.94
1.80	-0.0313	0.0370	0.0485	130.24	0.1523	0.3529	0.3843	66.66
1.85	-0.0324	0.0423	0.0533	127.45	0.1682	0.3665	0.4033	65.34
1.90	-0.0331	0.0480	0.0583	124.60	0.1851	0.3794	0.4222	63.99
1.95	-0.0333	0.0540	0.0634	121.69	0.2029	0.3916	0.4411	62.61
2.00	-0.0331	0.0603	0.0687	118.74	0.2214	0.4029	0.4598	61.21
2.05	-0.0322	0.0668	0.0742	115.74	0.2407	0.4133	0.4782	59.78
2.10	-0.0308	0.0735	0.0797	112.71	0.2606	0.4225	0.4964	58.33
2.15	-0.0287	0.0802	0.0852	109.66	0.2810	0.4305	0.5141	56.87
2.20	-0.0259	0.0869	0.0907	106.61	0.3018	0.4374	0.5314	55.40
2.25	-0.0225	0.0934	0.0961	103.56	0.3227	0.4429	0.5480	53.92
2.30	-0.0185	0.0998	0.1015	100.53	0.3438	0.4472	0.5640	52.45
2.35	-0.0140	0.1057	0.1067	97.53	0.3647	0.4501	0.5793	50.98
2.40	-0.0089	0.1113	0.1117	94.58	0.3854	0.4518	0.5939	49.54
2.45	-0.0034	0.1164	0.1165	91.68	0.4057	0.4523	0.6077	48.11
2.50	0.0024	0.1210	0.1211	88.85	0.4256	0.4518	0.6206	46.71
2.55	0.0085	0.1251	0.1254	86.10	0.4448	0.4501	0.6328	45.34
2.60	0.0148	0.1287	0.1295	83.44	0.4633	0.4476	0.6442	44.01
2.65	0.0212	0.1317	0.1334	80.86	0.4811	0.4443	0.6549	42.72
2.70	0.0276	0.1342	0.1370	78.38	0.4981	0.4402	0.6648	41.47
2.75	0.0340	0.1362	0.1404	75.99	0.5143	0.4356	0.6740	40.26
2.80	0.0403	0.1378	0.1435	73.70	0.5297	0.4305	0.6826	39.10
2.85	0.0465	0.1389	0.1465	71.50	0.5443	0.4250	0.6906	37.98
2.90	0.0525	0.1397	0.1492	69.40	0.5581	0.4192	0.6980	36.91
2.95	0.0584	0.1401	0.1518	67.39	0.5711	0.4131	0.7049	35.88
3.00	0.0640	0.1403	0.1542	65.47	0.5834	0.4069	0.7113	34.89
3.05	0.0695	0.1402	0.1565	63.64	0.5950	0.4006	0.7173	33.95
3.10	0.0747	0.1399	0.1586	61.89	0.6060	0.3942	0.7229	33.05
3.15	0.0797	0.1393	0.1605	60.22	0.6163	0.3878	0.7281	32.18
3.20	0.0845	0.1386	0.1624	58.63	0.6260	0.3815	0.7330	31.36
3.25	0.0891	0.1378	0.1641	57.11	0.6351	0.3751	0.7376	30.57
3.30	0.0935	0.1368	0.1657	55.66	0.6438	0.3689	0.7420	29.81
3.35	0.0977	0.1358	0.1673	54.27	0.6519	0.3627	0.7460	29.09
3.40	0.1017	0.1347	0.1687	52.95	0.6596	0.3566	0.7499	28.40
3.45	0.1055	0.1335	0.1701	51.69	0.6669	0.3507	0.7535	27.74
3.50	0.1091	0.1323	0.1715	50.48	0.6738	0.3449	0.7570	27.10
3.55	0.1126	0.1310	0.1727	49.33	0.6804	0.3392	0.7603	26.50
3.60	0.1159	0.1297	0.1739	48.22	0.6866	0.3337	0.7634	25.92
3.65	0.1190	0.1284	0.1751	47.16	0.6925	0.3283	0.7664	25.36
3.70	0.1220	0.1271	0.1762	46.15	0.6981	0.3230	0.7692	24.83
3.75	0.1249	0.1257	0.1772	45.18	0.7035	0.3179	0.7720	24.32
3.80	0.1277	0.1244	0.1783	44.25	0.7086	0.3129	0.7746	23.83
3.85	0.1303	0.1231	0.1793	43.36	0.7135	0.3081	0.7772	23.36
3.90	0.1329	0.1218	0.1802	42.50	0.7181	0.3034	0.7796	22.90
3.95	0.1353	0.1205	0.1811	41.68	0.7226	0.2989	0.7820	22.47

$k = 0.3 \qquad \sigma = 0.50$

a	$\frac{1-\sigma^2}{2} \cdot X$ REAL	$\frac{1-\sigma^2}{2} \cdot X$ IMAG.	$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
4.00	1.1693	-0.3478	0.9149	0.9146	0.4007	0.8624	-0.1192	0.8706	352.13
4.05	1.1694	-0.3407	0.9153	0.8967	0.4079	0.8601	-0.1179	0.8682	352.19
4.10	1.1695	-0.3340	0.9156	0.8795	0.4150	0.8580	-0.1167	0.8659	352.26
4.15	1.1695	-0.3275	0.9159	0.8631	0.4219	0.8559	-0.1154	0.8636	352.32
4.20	1.1694	-0.3212	0.9163	0.8472	0.4286	0.8539	-0.1142	0.8615	352.38
4.25	1.1693	-0.3152	0.9166	0.8319	0.4352	0.8520	-0.1130	0.8594	352.44
4.30	1.1691	-0.3094	0.9170	0.8172	0.4417	0.8501	-0.1119	0.8574	352.50
4.35	1.1689	-0.3037	0.9174	0.8030	0.4480	0.8483	-0.1107	0.8555	352.56
4.40	1.1686	-0.2983	0.9177	0.7894	0.4541	0.8466	-0.1096	0.8536	352.62
4.45	1.1683	-0.2931	0.9181	0.7762	0.4602	0.8449	-0.1085	0.8518	352.68
4.50	1.1680	-0.2881	0.9184	0.7634	0.4661	0.8432	-0.1074	0.8501	352.74
4.55	1.1676	-0.2832	0.9188	0.7511	0.4718	0.8417	-0.1063	0.8484	352.80
4.60	1.1672	-0.2785	0.9192	0.7392	0.4775	0.8401	-0.1053	0.8467	352.86
4.65	1.1668	-0.2739	0.9196	0.7277	0.4830	0.8386	-0.1043	0.8451	352.91
4.70	1.1663	-0.2695	0.9199	0.7166	0.4884	0.8372	-0.1033	0.8435	352.97
4.75	1.1658	-0.2652	0.9203	0.7057	0.4937	0.8358	-0.1023	0.8420	353.02
4.80	1.1653	-0.2611	0.9207	0.6953	0.4989	0.8344	-0.1014	0.8405	353.07
4.85	1.1648	-0.2571	0.9210	0.6851	0.5040	0.8330	-0.1004	0.8391	353.13
4.90	1.1642	-0.2532	0.9214	0.6753	0.5090	0.8317	-0.0995	0.8377	353.18
4.95	1.1637	-0.2494	0.9218	0.6657	0.5139	0.8305	-0.0986	0.8363	353.23
5.00	1.1631	-0.2457	0.9222	0.6564	0.5187	0.8292	-0.0977	0.8350	353.28
5.05	1.1625	-0.2421	0.9225	0.6473	0.5234	0.8280	-0.0968	0.8337	353.33
5.10	1.1619	-0.2386	0.9229	0.6385	0.5281	0.8268	-0.0960	0.8324	353.38
5.15	1.1613	-0.2352	0.9233	0.6300	0.5326	0.8257	-0.0951	0.8311	353.43
5.20	1.1607	-0.2319	0.9237	0.6216	0.5371	0.8245	-0.0943	0.8299	353.48
5.25	1.1600	-0.2287	0.9240	0.6135	0.5414	0.8234	-0.0935	0.8287	353.52
5.30	1.1594	-0.2256	0.9244	0.6056	0.5457	0.8224	-0.0927	0.8276	353.57
5.35	1.1588	-0.2226	0.9248	0.5979	0.5499	0.8213	-0.0919	0.8264	353.61
5.40	1.1581	-0.2196	0.9251	0.5904	0.5541	0.8203	-0.0911	0.8253	353.66
5.45	1.1575	-0.2167	0.9255	0.5831	0.5582	0.8192	-0.0904	0.8242	353.70
5.50	1.1568	-0.2139	0.9258	0.5759	0.5622	0.8182	-0.0896	0.8231	353.75
5.55	1.1562	-0.2111	0.9262	0.5690	0.5661	0.8173	-0.0889	0.8221	353.79
5.60	1.1555	-0.2084	0.9266	0.5622	0.5700	0.8163	-0.0882	0.8211	353.83
5.65	1.1548	-0.2058	0.9269	0.5555	0.5738	0.8154	-0.0875	0.8201	353.88
5.70	1.1542	-0.2032	0.9273	0.5490	0.5775	0.8145	-0.0868	0.8191	353.92
5.75	1.1535	-0.2007	0.9276	0.5426	0.5812	0.8136	-0.0861	0.8181	353.96
5.80	1.1529	-0.1983	0.9279	0.5364	0.5848	0.8127	-0.0854	0.8172	354.00
5.85	1.1522	-0.1959	0.9283	0.5303	0.5884	0.8118	-0.0848	0.8162	354.04
5.90	1.1516	-0.1936	0.9286	0.5244	0.5919	0.8110	-0.0841	0.8153	354.08
5.95	1.1509	-0.1913	0.9290	0.5186	0.5954	0.8101	-0.0835	0.8144	354.12
6.00	1.1503	-0.1890	0.9293	0.5129	0.5988	0.8093	-0.0828	0.8135	354.16
6.05	1.1496	-0.1869	0.9296	0.5073	0.6021	0.8085	-0.0822	0.8127	354.20
6.10	1.1490	-0.1847	0.9299	0.5018	0.6054	0.8077	-0.0816	0.8118	354.23
6.15	1.1483	-0.1826	0.9303	0.4965	0.6087	0.8069	-0.0810	0.8110	354.27
6.20	1.1477	-0.1806	0.9306	0.4912	0.6119	0.8062	-0.0804	0.8102	354.31
6.25	1.1471	-0.1786	0.9309	0.4861	0.6150	0.8054	-0.0798	0.8094	354.34
6.30	1.1464	-0.1766	0.9312	0.4811	0.6181	0.8047	-0.0792	0.8086	354.38
6.35	1.1458	-0.1747	0.9315	0.4761	0.6212	0.8040	-0.0786	0.8078	354.42
6.40	1.1452	-0.1728	0.9318	0.4713	0.6242	0.8033	-0.0780	0.8070	354.45
6.45	1.1446	-0.1709	0.9321	0.4666	0.6272	0.8026	-0.0775	0.8063	354.49
6.50	1.1439	-0.1691	0.9324	0.4619	0.6301	0.8019	-0.0769	0.8056	354.52
6.55	1.1433	-0.1673	0.9327	0.4573	0.6330	0.8012	-0.0764	0.8048	354.56
6.60	1.1427	-0.1656	0.9330	0.4529	0.6358	0.8005	-0.0758	0.8041	354.59
6.65	1.1421	-0.1639	0.9333	0.4485	0.6386	0.7999	-0.0753	0.8034	354.62
6.70	1.1415	-0.1622	0.9336	0.4441	0.6414	0.7992	-0.0748	0.8027	354.66
6.75	1.1410	-0.1606	0.9339	0.4399	0.6441	0.7986	-0.0742	0.8020	354.69
6.80	1.1404	-0.1589	0.9342	0.4357	0.6468	0.7980	-0.0737	0.8014	354.72
6.85	1.1398	-0.1574	0.9345	0.4317	0.6494	0.7974	-0.0732	0.8007	354.75
6.90	1.1392	-0.1558	0.9347	0.4277	0.6520	0.7968	-0.0727	0.8001	354.78
6.95	1.1387	-0.1543	0.9350	0.4237	0.6546	0.7962	-0.0722	0.7994	354.82

$k =$ 0.3 $\sigma =$ 0.50								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.1376	0.1192	0.1821	40.89	0.7269	0.2944	0.7843	22.05
4.05	0.1399	0.1179	0.1829	40.13	0.7310	0.2901	0.7865	21.65
4.10	0.1420	0.1167	0.1838	39.40	0.7350	0.2860	0.7887	21.26
4.15	0.1441	0.1154	0.1846	38.69	0.7388	0.2819	0.7908	20.89
4.20	0.1461	0.1142	0.1854	38.02	0.7425	0.2780	0.7928	20.53
4.25	0.1480	0.1130	0.1862	37.36	0.7460	0.2742	0.7948	20.18
4.30	0.1499	0.1119	0.1870	36.73	0.7494	0.2705	0.7968	19.85
4.35	0.1517	0.1107	0.1878	36.12	0.7527	0.2669	0.7987	19.52
4.40	0.1534	0.1096	0.1886	35.54	0.7559	0.2634	0.8005	19.21
4.45	0.1551	0.1085	0.1893	34.97	0.7591	0.2600	0.8024	18.91
4.50	0.1568	0.1074	0.1900	34.42	0.7621	0.2567	0.8041	18.62
4.55	0.1583	0.1063	0.1907	33.89	0.7650	0.2535	0.8059	18.33
4.60	0.1599	0.1053	0.1914	33.37	0.7678	0.2504	0.8076	18.06
4.65	0.1614	0.1043	0.1921	32.87	0.7706	0.2473	0.8093	17.79
4.70	0.1628	0.1033	0.1928	32.39	0.7733	0.2444	0.8110	17.54
4.75	0.1642	0.1023	0.1935	31.92	0.7759	0.2415	0.8126	17.29
4.80	0.1656	0.1014	0.1942	31.47	0.7785	0.2387	0.8142	17.04
4.85	0.1670	0.1004	0.1948	31.02	0.7809	0.2359	0.8158	16.81
4.90	0.1683	0.0995	0.1955	30.60	0.7834	0.2332	0.8174	16.58
4.95	0.1695	0.0986	0.1961	30.18	0.7857	0.2306	0.8189	16.36
5.00	0.1708	0.0977	0.1967	29.77	0.7881	0.2281	0.8204	16.14
5.05	0.1720	0.0968	0.1974	29.38	0.7903	0.2256	0.8219	15.93
5.10	0.1732	0.0960	0.1980	29.00	0.7925	0.2232	0.8234	15.73
5.15	0.1743	0.0951	0.1986	28.62	0.7947	0.2208	0.8248	15.53
5.20	0.1755	0.0943	0.1992	28.26	0.7968	0.2185	0.8262	15.33
5.25	0.1766	0.0935	0.1998	27.90	0.7989	0.2162	0.8276	15.14
5.30	0.1776	0.0927	0.2004	27.56	0.8009	0.2140	0.8290	14.96
5.35	0.1787	0.0919	0.2010	27.22	0.8029	0.2118	0.8304	14.78
5.40	0.1797	0.0911	0.2015	26.89	0.8049	0.2097	0.8317	14.60
5.45	0.1808	0.0904	0.2021	26.57	0.8068	0.2076	0.8331	14.43
5.50	0.1818	0.0896	0.2027	26.25	0.8087	0.2056	0.8344	14.26
5.55	0.1827	0.0889	0.2032	25.95	0.8105	0.2036	0.8357	14.10
5.60	0.1837	0.0882	0.2038	25.65	0.8123	0.2016	0.8369	13.94
5.65	0.1846	0.0875	0.2043	25.36	0.8141	0.1997	0.8382	13.78
5.70	0.1855	0.0868	0.2048	25.07	0.8158	0.1978	0.8394	13.63
5.75	0.1864	0.0861	0.2054	24.79	0.8175	0.1959	0.8407	13.48
5.80	0.1873	0.0854	0.2059	24.51	0.8192	0.1941	0.8419	13.33
5.85	0.1882	0.0848	0.2064	24.25	0.8208	0.1923	0.8430	13.19
5.90	0.1890	0.0841	0.2069	23.98	0.8224	0.1906	0.8442	13.05
5.95	0.1899	0.0835	0.2074	23.73	0.8240	0.1888	0.8454	12.91
6.00	0.1907	0.0828	0.2079	23.48	0.8256	0.1872	0.8465	12.77
6.05	0.1915	0.0822	0.2084	23.23	0.8271	0.1855	0.8476	12.64
6.10	0.1923	0.0816	0.2089	22.99	0.8286	0.1839	0.8488	12.51
6.15	0.1931	0.0810	0.2093	22.75	0.8301	0.1823	0.8498	12.38
6.20	0.1938	0.0804	0.2098	22.52	0.8315	0.1807	0.8509	12.26
6.25	0.1946	0.0798	0.2103	22.29	0.8330	0.1791	0.8520	12.14
6.30	0.1953	0.0792	0.2107	22.07	0.8344	0.1776	0.8530	12.02
6.35	0.1960	0.0786	0.2112	21.85	0.8357	0.1761	0.8541	11.90
6.40	0.1967	0.0780	0.2116	21.63	0.8371	0.1746	0.8551	11.78
6.45	0.1974	0.0775	0.2121	21.42	0.8384	0.1732	0.8561	11.67
6.50	0.1981	0.0769	0.2125	21.22	0.8397	0.1718	0.8571	11.56
6.55	0.1988	0.0764	0.2130	21.01	0.8410	0.1703	0.8581	11.45
6.60	0.1995	0.0758	0.2134	20.81	0.8423	0.1690	0.8591	11.34
6.65	0.2001	0.0753	0.2138	20.62	0.8435	0.1676	0.8600	11.24
6.70	0.2008	0.0748	0.2142	20.42	0.8448	0.1663	0.8610	11.13
6.75	0.2014	0.0742	0.2146	20.24	0.8460	0.1649	0.8619	11.03
6.80	0.2020	0.0737	0.2150	20.05	0.8472	0.1636	0.8628	10.93
6.85	0.2026	0.0732	0.2155	19.87	0.8483	0.1624	0.8637	10.84
6.90	0.2032	0.0727	0.2158	19.69	0.8495	0.1611	0.8646	10.74
6.95	0.2038	0.0722	0.2162	19.51	0.8506	0.1599	0.8655	10.64

a	$\frac{1-\sigma^2}{2}\cdot x$ REAL	$\frac{1-\sigma^2}{2}\cdot x$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
	$k = 0.3$			$\sigma = 0.50$					
7.00	1.1381	-0.1528	0.9353	0.4198	0.6571	0.7956	-0.0717	0.7988	354.85
7.05	1.1375	-0.1513	0.9355	0.4160	0.6597	0.7950	-0.0713	0.7982	354.88
7.10	1.1370	-0.1499	0.9358	0.4123	0.6621	0.7945	-0.0708	0.7976	354.91
7.15	1.1364	-0.1484	0.9361	0.4086	0.6646	0.7939	-0.0703	0.7970	354.94
7.20	1.1359	-0.1471	0.9363	0.4050	0.6670	0.7933	-0.0699	0.7964	354.97
7.25	1.1354	-0.1457	0.9366	0.4015	0.6693	0.7928	-0.0694	0.7958	355.00
7.30	1.1348	-0.1443	0.9368	0.3980	0.6717	0.7923	-0.0689	0.7953	355.03
7.35	1.1343	-0.1430	0.9371	0.3946	0.6740	0.7918	-0.0685	0.7947	355.06
7.40	1.1338	-0.1417	0.9373	0.3912	0.6763	0.7912	-0.0681	0.7942	355.08
7.45	1.1333	-0.1405	0.9376	0.3879	0.6785	0.7907	-0.0676	0.7936	355.11
7.50	1.1327	-0.1392	0.9378	0.3846	0.6807	0.7902	-0.0672	0.7931	355.14
7.55	1.1322	-0.1380	0.9381	0.3814	0.6829	0.7897	-0.0668	0.7925	355.17
7.60	1.1317	-0.1368	0.9383	0.3782	0.6851	0.7892	-0.0664	0.7920	355.19
7.65	1.1312	-0.1356	0.9385	0.3751	0.6872	0.7888	-0.0659	0.7915	355.22
7.70	1.1307	-0.1344	0.9388	0.3721	0.6893	0.7883	-0.0655	0.7910	355.25
7.75	1.1303	-0.1332	0.9390	0.3691	0.6914	0.7878	-0.0651	0.7905	355.27
7.80	1.1298	-0.1321	0.9392	0.3661	0.6934	0.7874	-0.0647	0.7900	355.30
7.85	1.1293	-0.1310	0.9394	0.3632	0.6955	0.7869	-0.0643	0.7895	355.33
7.90	1.1288	-0.1299	0.9397	0.3603	0.6975	0.7865	-0.0639	0.7891	355.35
7.95	1.1283	-0.1288	0.9399	0.3575	0.6994	0.7860	-0.0636	0.7886	355.38
8.00	1.1279	-0.1277	0.9401	0.3547	0.7014	0.7856	-0.0632	0.7881	355.40
8.05	1.1274	-0.1267	0.9403	0.3519	0.7033	0.7852	-0.0628	0.7877	355.43
8.10	1.1270	-0.1257	0.9405	0.3492	0.7052	0.7847	-0.0624	0.7872	355.45
8.15	1.1265	-0.1247	0.9407	0.3466	0.7071	0.7843	-0.0621	0.7868	355.48
8.20	1.1261	-0.1237	0.9410	0.3440	0.7090	0.7839	-0.0617	0.7863	355.50
8.25	1.1256	-0.1227	0.9412	0.3414	0.7108	0.7835	-0.0613	0.7859	355.52
8.30	1.1252	-0.1217	0.9414	0.3388	0.7126	0.7831	-0.0610	0.7855	355.55
8.35	1.1247	-0.1208	0.9416	0.3363	0.7144	0.7827	-0.0606	0.7850	355.57
8.40	1.1243	-0.1198	0.9418	0.3338	0.7162	0.7823	-0.0603	0.7846	355.59
8.45	1.1239	-0.1189	0.9420	0.3314	0.7179	0.7819	-0.0599	0.7842	355.62
8.50	1.1234	-0.1180	0.9422	0.3290	0.7196	0.7815	-0.0596	0.7838	355.64
8.55	1.1230	-0.1171	0.9424	0.3266	0.7213	0.7812	-0.0593	0.7834	355.66
8.60	1.1226	-0.1162	0.9426	0.3243	0.7230	0.7808	-0.0589	0.7830	355.68
8.65	1.1222	-0.1153	0.9427	0.3220	0.7247	0.7804	-0.0586	0.7826	355.71
8.70	1.1218	-0.1145	0.9429	0.3197	0.7263	0.7801	-0.0583	0.7822	355.73
8.75	1.1214	-0.1136	0.9431	0.3175	0.7280	0.7797	-0.0579	0.7818	355.75
8.80	1.1210	-0.1128	0.9433	0.3153	0.7296	0.7793	-0.0576	0.7815	355.77
8.85	1.1206	-0.1120	0.9435	0.3131	0.7312	0.7790	-0.0573	0.7811	355.79
8.90	1.1202	-0.1111	0.9437	0.3109	0.7328	0.7786	-0.0570	0.7807	355.31
8.95	1.1198	-0.1103	0.9439	0.3088	0.7343	0.7783	-0.0567	0.7804	355.83
9.00	1.1194	-0.1096	0.9440	0.3067	0.7359	0.7780	-0.0564	0.7800	355.85
9.05	1.1190	-0.1088	0.9442	0.3047	0.7374	0.7776	-0.0561	0.7796	355.88
9.10	1.1186	-0.1080	0.9444	0.3026	0.7389	0.7773	-0.0558	0.7793	355.90
9.15	1.1183	-0.1072	0.9446	0.3006	0.7404	0.7770	-0.0555	0.7789	355.92
9.20	1.1179	-0.1065	0.9447	0.2986	0.7418	0.7766	-0.0552	0.7786	355.93
9.25	1.1175	-0.1058	0.9449	0.2967	0.7433	0.7763	-0.0549	0.7783	355.95
9.30	1.1171	-0.1050	0.9451	0.2947	0.7447	0.7760	-0.0546	0.7779	355.97
9.35	1.1168	-0.1043	0.9452	0.2928	0.7462	0.7757	-0.0543	0.7776	355.99
9.40	1.1164	-0.1036	0.9454	0.2909	0.7476	0.7754	-0.0541	0.7773	356.01
9.45	1.1161	-0.1029	0.9456	0.2891	0.7490	0.7751	-0.0538	0.7770	356.03
9.50	1.1157	-0.1022	0.9457	0.2872	0.7503	0.7748	-0.0535	0.7766	356.05
9.55	1.1154	-0.1015	0.9459	0.2854	0.7517	0.7745	-0.0532	0.7763	356.07
9.60	1.1150	-0.1009	0.9461	0.2836	0.7531	0.7742	-0.0530	0.7760	356.09
9.65	1.1147	-0.1002	0.9462	0.2818	0.7544	0.7739	-0.0527	0.7757	356.11
9.70	1.1143	-0.0995	0.9464	0.2801	0.7557	0.7736	-0.0524	0.7754	356.12
9.75	1.1140	-0.0989	0.9465	0.2784	0.7570	0.7733	-0.0522	0.7751	356.14
9.80	1.1136	-0.0983	0.9467	0.2767	0.7583	0.7730	-0.0519	0.7748	356.16
9.85	1.1133	-0.0976	0.9468	0.2750	0.7596	0.7728	-0.0516	0.7745	356.18
9.90	1.1130	-0.0970	0.9470	0.2733	0.7609	0.7725	-0.0514	0.7742	356.19
9.95	1.1127	-0.0964	0.9471	0.2716	0.7621	0.7722	-0.0511	0.7739	356.21
10.00	1.1123	-0.0958	0.9473	0.2700	0.7634	0.7719	-0.0509	0.7736	356.23

	$k = 0.3$ $\sigma = 0.50$							
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.2044	0.0717	0.2166	19.34	0.8517	0.1586	0.8664	10.55
7.05	0.2050	0.0713	0.2170	19.17	0.8528	0.1574	0.8672	10.46
7.10	0.2055	0.0708	0.2174	19.00	0.8539	0.1562	0.8681	10.37
7.15	0.2061	0.0703	0.2178	18.84	0.8550	0.1551	0.8689	10.28
7.20	0.2067	0.0699	0.2181	18.68	0.8560	0.1539	0.8698	10.19
7.25	0.2072	0.0694	0.2185	18.52	0.8571	0.1528	0.8706	10.11
7.30	0.2077	0.0689	0.2189	18.36	0.8581	0.1517	0.8714	10.02
7.35	0.2082	0.0685	0.2192	18.21	0.8591	0.1506	0.8722	9.94
7.40	0.2088	0.0681	0.2196	18.06	0.8601	0.1495	0.8730	9.86
7.45	0.2093	0.0676	0.2199	17.91	0.8611	0.1484	0.8738	9.78
7.50	0.2098	0.0672	0.2203	17.76	0.8620	0.1473	0.8745	9.70
7.55	0.2103	0.0668	0.2206	17.62	0.8630	0.1463	0.8753	9.62
7.60	0.2108	0.0664	0.2210	17.48	0.8639	0.1453	0.8760	9.55
7.65	0.2112	0.0659	0.2213	17.34	0.8648	0.1443	0.8768	9.47
7.70	0.2117	0.0655	0.2216	17.20	0.8658	0.1433	0.8775	9.40
7.75	0.2122	0.0651	0.2219	17.06	0.8666	0.1423	0.8782	9.32
7.80	0.2126	0.0647	0.2223	16.93	0.8675	0.1413	0.8790	9.25
7.85	0.2131	0.0643	0.2226	16.80	0.8684	0.1403	0.8797	9.18
7.90	0.2135	0.0639	0.2229	16.67	0.8693	0.1394	0.8804	9.11
7.95	0.2140	0.0636	0.2232	16.54	0.8701	0.1385	0.8811	9.04
8.00	0.2144	0.0632	0.2235	16.42	0.8710	0.1375	0.8818	8.97
8.05	0.2148	0.0628	0.2238	16.29	0.8718	0.1366	0.8824	8.91
8.10	0.2153	0.0624	0.2241	16.17	0.8726	0.1357	0.8831	8.84
8.15	0.2157	0.0621	0.2244	16.05	0.8734	0.1348	0.8838	8.78
8.20	0.2161	0.0617	0.2247	15.93	0.8742	0.1340	0.8844	8.71
8.25	0.2165	0.0613	0.2250	15.82	0.8750	0.1331	0.8851	8.65
8.30	0.2169	0.0610	0.2253	15.70	0.8758	0.1322	0.8857	8.59
8.35	0.2173	0.0606	0.2256	15.59	0.8765	0.1314	0.8863	8.53
8.40	0.2177	0.0603	0.2259	15.48	0.8773	0.1306	0.8870	8.47
8.45	0.2181	0.0599	0.2262	15.37	0.8780	0.1297	0.8876	8.41
8.50	0.2185	0.0596	0.2264	15.26	0.8788	0.1289	0.8882	8.35
8.55	0.2188	0.0593	0.2267	15.15	0.8795	0.1281	0.8888	8.29
8.60	0.2192	0.0589	0.2270	15.04	0.8802	0.1273	0.8894	8.23
8.65	0.2196	0.0586	0.2273	14.94	0.8809	0.1266	0.8900	8.18
8.70	0.2199	0.0583	0.2275	14.84	0.8816	0.1258	0.8906	8.12
8.75	0.2203	0.0579	0.2278	14.74	0.8823	0.1250	0.8911	8.06
8.80	0.2207	0.0576	0.2281	14.64	0.8830	0.1243	0.8917	8.01
8.85	0.2210	0.0573	0.2283	14.54	0.8837	0.1235	0.8923	7.96
8.90	0.2214	0.0570	0.2286	14.44	0.8844	0.1228	0.8929	7.90
8.95	0.2217	0.0567	0.2288	14.34	0.8850	0.1221	0.8934	7.85
9.00	0.2220	0.0564	0.2291	14.25	0.8857	0.1213	0.8940	7.80
9.05	0.2224	0.0561	0.2293	14.15	0.8863	0.1206	0.8945	7.75
9.10	0.2227	0.0558	0.2296	14.06	0.8870	0.1199	0.8950	7.70
9.15	0.2230	0.0555	0.2298	13.97	0.8876	0.1192	0.8956	7.65
9.20	0.2234	0.0552	0.2301	13.88	0.8882	0.1185	0.8961	7.60
9.25	0.2237	0.0549	0.2303	13.79	0.8888	0.1179	0.8966	7.55
9.30	0.2240	0.0546	0.2305	13.70	0.8895	0.1172	0.8971	7.51
9.35	0.2243	0.0543	0.2308	13.62	0.8901	0.1165	0.8977	7.46
9.40	0.2246	0.0541	0.2310	13.53	0.8907	0.1159	0.8982	7.41
9.45	0.2249	0.0538	0.2313	13.45	0.8913	0.1152	0.8987	7.37
9.50	0.2252	0.0535	0.2315	13.36	0.8918	0.1146	0.8992	7.32
9.55	0.2255	0.0532	0.2317	13.28	0.8924	0.1139	0.8997	7.28
9.60	0.2258	0.0530	0.2319	13.20	0.8930	0.1133	0.9001	7.23
9.65	0.2261	0.0527	0.2322	13.12	0.8936	0.1127	0.9006	7.19
9.70	0.2264	0.0524	0.2324	13.04	0.8941	0.1121	0.9011	7.14
9.75	0.2267	0.0522	0.2326	12.96	0.8947	0.1115	0.9016	7.10
9.80	0.2270	0.0519	0.2328	12.88	0.8952	0.1109	0.9021	7.06
9.85	0.2272	0.0516	0.2330	12.81	0.8958	0.1103	0.9025	7.02
9.90	0.2275	0.0514	0.2332	12.73	0.8963	0.1097	0.9030	6.98
9.95	0.2278	0.0511	0.2335	12.65	0.8968	0.1091	0.9034	6.94
10.00	0.2281	0.0509	0.2337	12.58	0.8974	0.1085	0.9039	6.90

$k = 0.4$ $\sigma = 0.00$									
a	$\frac{1-\sigma^2}{2}\cdot X$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.2573	-9.9985	0.4201	5.5426	0.0039	1.0050	0.0242	1.0053	1.38
1.05	1.2574	-9.0687	0.4383	5.4721	0.0042	1.0061	0.0264	1.0064	1.51
1.10	1.2576	-8.2627	0.4561	5.3992	0.0045	1.0073	0.0288	1.0077	1.64
1.15	1.2577	-7.5595	0.4735	5.3242	0.0049	1.0086	0.0312	1.0091	1.77
1.20	1.2579	-6.9424	0.4905	5.2470	0.0053	1.0101	0.0336	1.0107	1.90
1.25	1.2582	-6.3978	0.5071	5.1679	0.0057	1.0118	0.0360	1.0125	2.04
1.30	1.2584	-5.9149	0.5232	5.0870	0.0062	1.0137	0.0384	1.0144	2.17
1.35	1.2587	-5.4845	0.5389	5.0046	0.0067	1.0158	0.0407	1.0166	2.30
1.40	1.2590	-5.0995	0.5542	4.9206	0.0073	1.0180	0.0430	1.0189	2.42
1.45	1.2593	-4.7536	0.5690	4.8354	0.0079	1.0204	0.0453	1.0214	2.54
1.50	1.2597	-4.4417	0.5834	4.7490	0.0087	1.0231	0.0475	1.0242	2.66
1.55	1.2601	-4.1595	0.5973	4.6617	0.0095	1.0259	0.0495	1.0270	2.76
1.60	1.2605	-3.9034	0.6107	4.5736	0.0103	1.0288	0.0514	1.0301	2.86
1.65	1.2610	-3.6702	0.6237	4.4849	0.0113	1.0320	0.0532	1.0333	2.95
1.70	1.2615	-3.4573	0.6362	4.3958	0.0123	1.0353	0.0547	1.0367	3.03
1.75	1.2620	-3.2624	0.6482	4.3063	0.0135	1.0387	0.0561	1.0402	3.09
1.80	1.2626	-3.0836	0.6598	4.2168	0.0147	1.0423	0.0573	1.0438	3.15
1.85	1.2632	-2.9191	0.6709	4.1273	0.0161	1.0459	0.0582	1.0475	3.19
1.90	1.2639	-2.7675	0.6815	4.0379	0.0176	1.0497	0.0589	1.0513	3.21
1.95	1.2646	-2.6274	0.6917	3.9490	0.0193	1.0534	0.0593	1.0551	3.22
2.00	1.2653	-2.4978	0.7014	3.8606	0.0211	1.0573	0.0595	1.0589	3.22
2.05	1.2660	-2.3776	0.7107	3.7728	0.0230	1.0611	0.0594	1.0628	3.20
2.10	1.2668	-2.2660	0.7196	3.6858	0.0251	1.0649	0.0590	1.0665	3.17
2.15	1.2676	-2.1622	0.7280	3.5998	0.0273	1.0686	0.0584	1.0702	3.13
2.20	1.2684	-2.0654	0.7360	3.5149	0.0298	1.0723	0.0575	1.0738	3.07
2.25	1.2692	-1.9752	0.7436	3.4311	0.0324	1.0759	0.0564	1.0773	3.00
2.30	1.2700	-1.8908	0.7508	3.3487	0.0351	1.0793	0.0550	1.0807	2.92
2.35	1.2709	-1.8119	0.7577	3.2676	0.0381	1.0826	0.0534	1.0839	2.82
2.40	1.2717	-1.7380	0.7641	3.1881	0.0413	1.0857	0.0516	1.0869	2.72
2.45	1.2726	-1.6687	0.7702	3.1101	0.0446	1.0886	0.0496	1.0898	2.61
2.50	1.2734	-1.6036	0.7760	3.0339	0.0481	1.0914	0.0474	1.0924	2.49
2.55	1.2742	-1.5424	0.7815	2.9593	0.0519	1.0939	0.0451	1.0948	2.36
2.60	1.2750	-1.4849	0.7866	2.8866	0.0558	1.0962	0.0427	1.0970	2.23
2.65	1.2758	-1.4308	0.7915	2.8157	0.0599	1.0983	0.0402	1.0990	2.10
2.70	1.2765	-1.3797	0.7960	2.7467	0.0641	1.1001	0.0376	1.1008	1.96
2.75	1.2772	-1.3316	0.8003	2.6796	0.0686	1.1017	0.0350	1.1023	1.82
2.80	1.2779	-1.2861	0.8044	2.6144	0.0732	1.1032	0.0324	1.1036	1.68
2.85	1.2785	-1.2432	0.8082	2.5512	0.0780	1.1044	0.0297	1.1048	1.54
2.90	1.2791	-1.2026	0.8118	2.4899	0.0829	1.1054	0.0271	1.1057	1.40
2.95	1.2796	-1.1642	0.8152	2.4306	0.0880	1.1062	0.0244	1.1065	1.27
3.00	1.2800	-1.1278	0.8184	2.3732	0.0932	1.1068	0.0219	1.1071	1.13
3.05	1.2804	-1.0933	0.8214	2.3176	0.0985	1.1073	0.0193	1.1075	1.00
3.10	1.2807	-1.0607	0.8243	2.2640	0.1039	1.1076	0.0169	1.1077	0.87
3.15	1.2810	-1.0296	0.8270	2.2122	0.1095	1.1078	0.0145	1.1079	0.75
3.20	1.2811	-1.0002	0.8295	2.1622	0.1151	1.1078	0.0122	1.1079	0.63
3.25	1.2812	-0.9722	0.8320	2.1140	0.1208	1.1077	0.0100	1.1078	0.52
3.30	1.2812	-0.9456	0.8343	2.0675	0.1265	1.1075	0.0078	1.1076	0.40
3.35	1.2812	-0.9202	0.8364	2.0227	0.1323	1.1073	0.0058	1.1073	0.30
3.40	1.2810	-0.8961	0.8385	1.9795	0.1381	1.1069	0.0038	1.1069	0.20
3.45	1.2808	-0.8731	0.8405	1.9379	0.1440	1.1064	0.0019	1.1064	0.10
3.50	1.2805	-0.8512	0.8424	1.8978	0.1499	1.1059	0.0002	1.1059	0.01
3.55	1.2802	-0.8303	0.8442	1.8592	0.1558	1.1054	-0.0015	1.1054	359.92
3.60	1.2797	-0.8103	0.8460	1.8219	0.1617	1.1048	-0.0032	1.1048	359.84
3.65	1.2792	-0.7912	0.8477	1.7861	0.1676	1.1041	-0.0047	1.1041	359.76
3.70	1.2786	-0.7730	0.8493	1.7516	0.1735	1.1034	-0.0061	1.1034	359.68
3.75	1.2780	-0.7555	0.8509	1.7183	0.1794	1.1027	-0.0075	1.1027	359.61
3.80	1.2773	-0.7388	0.8524	1.6862	0.1852	1.1020	-0.0088	1.1020	359.54
3.85	1.2765	-0.7227	0.8538	1.6553	0.1910	1.1012	-0.0100	1.1013	359.48
3.90	1.2756	-0.7074	0.8552	1.6255	0.1968	1.1004	-0.0112	1.1005	359.42
3.95	1.2747	-0.6926	0.8566	1.5967	0.2026	1.0997	-0.0123	1.0997	359.36

$k = 0.4$ $\sigma = 0.00$

a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0050	-0.0242	0.0247	258.27	0.0124	0.0985	0.0992	82.83
1.05	-0.0061	-0.0264	0.0271	257.08	0.0150	0.1082	0.1092	82.11
1.10	-0.0073	-0.0288	0.0297	255.84	0.0180	0.1183	0.1196	81.35
1.15	-0.0086	-0.0312	0.0323	254.54	0.0214	0.1287	0.1305	80.55
1.20	-0.0101	-0.0336	0.0351	253.19	0.0253	0.1395	0.1417	79.73
1.25	-0.0118	-0.0360	0.0379	251.79	0.0296	0.1505	0.1534	78.87
1.30	-0.0137	-0.0384	0.0407	250.35	0.0344	0.1617	0.1654	77.99
1.35	-0.0158	-0.0407	0.0437	248.85	0.0398	0.1732	0.1777	77.07
1.40	-0.0180	-0.0430	0.0467	247.31	0.0456	0.1848	0.1904	76.13
1.45	-0.0204	-0.0453	0.0497	245.72	0.0521	0.1966	0.2034	75.16
1.50	-0.0231	-0.0475	0.0528	244.09	0.0591	0.2084	0.2166	74.17
1.55	-0.0259	-0.0495	0.0558	242.43	0.0667	0.2202	0.2301	73.15
1.60	-0.0288	-0.0514	0.0589	240.72	0.0749	0.2320	0.2438	72.10
1.65	-0.0320	-0.0532	0.0620	238.98	0.0837	0.2437	0.2577	71.04
1.70	-0.0353	-0.0547	0.0651	237.21	0.0931	0.2553	0.2717	69.95
1.75	-0.0387	-0.0561	0.0682	235.41	0.1031	0.2666	0.2859	68.85
1.80	-0.0423	-0.0573	0.0712	233.59	0.1137	0.2777	0.3001	67.73
1.85	-0.0459	-0.0582	0.0742	231.74	0.1249	0.2885	0.3144	66.60
1.90	-0.0497	-0.0589	0.0770	229.87	0.1365	0.2990	0.3287	65.45
1.95	-0.0534	-0.0593	0.0799	227.99	0.1487	0.3090	0.3429	64.30
2.00	-0.0575	-0.0595	0.0826	226.10	0.1614	0.3186	0.3571	63.14
2.05	-0.0611	-0.0594	0.0852	224.20	0.1745	0.3277	0.3712	61.97
2.10	-0.0649	-0.0590	0.0877	222.30	0.1880	0.3362	0.3852	60.79
2.15	-0.0686	-0.0584	0.0901	220.40	0.2018	0.3442	0.3990	59.62
2.20	-0.0723	-0.0575	0.0924	218.50	0.2159	0.3516	0.4126	58.45
2.25	-0.0759	-0.0564	0.0945	216.61	0.2303	0.3583	0.4259	57.28
2.30	-0.0793	-0.0550	0.0965	214.73	0.2448	0.3644	0.4390	56.11
2.35	-0.0826	-0.0534	0.0983	212.87	0.2595	0.3699	0.4518	54.95
2.40	-0.0857	-0.0516	0.1000	211.03	0.2742	0.3747	0.4643	53.81
2.45	-0.0886	-0.0496	0.1015	209.22	0.2890	0.3789	0.4765	52.67
2.50	-0.0914	-0.0474	0.1029	207.43	0.3037	0.3824	0.4884	51.55
2.55	-0.0939	-0.0451	0.1041	205.67	0.3183	0.3853	0.4998	50.44
2.60	-0.0962	-0.0427	0.1052	203.94	0.3328	0.3876	0.5109	49.35
2.65	-0.0983	-0.0402	0.1062	202.25	0.3472	0.3894	0.5217	48.28
2.70	-0.1001	-0.0376	0.1069	200.60	0.3613	0.3905	0.5320	47.22
2.75	-0.1017	-0.0350	0.1076	198.98	0.3752	0.3911	0.5420	46.19
2.80	-0.1032	-0.0324	0.1081	197.41	0.3888	0.3913	0.5516	45.18
2.85	-0.1044	-0.0297	0.1085	195.88	0.4020	0.3909	0.5608	44.20
2.90	-0.1054	-0.0271	0.1088	194.40	0.4150	0.3902	0.5696	43.24
2.95	-0.1062	-0.0244	0.1090	192.96	0.4276	0.3890	0.5781	42.30
3.00	-0.1068	-0.0219	0.1091	191.57	0.4398	0.3875	0.5862	41.38
3.05	-0.1073	-0.0193	0.1090	190.22	0.4517	0.3857	0.5939	40.49
3.10	-0.1076	-0.0169	0.1089	188.92	0.4631	0.3836	0.6014	39.63
3.15	-0.1078	-0.0145	0.1088	187.66	0.4743	0.3812	0.6085	38.79
3.20	-0.1078	-0.0122	0.1085	186.45	0.4850	0.3786	0.6153	37.98
3.25	-0.1077	-0.0100	0.1082	185.29	0.4953	0.3758	0.6218	37.19
3.30	-0.1075	-0.0078	0.1078	184.16	0.5053	0.3729	0.6280	36.43
3.35	-0.1073	-0.0058	0.1074	183.08	0.5149	0.3698	0.6339	35.69
3.40	-0.1069	-0.0038	0.1070	182.04	0.5241	0.3666	0.6397	34.97
3.45	-0.1064	-0.0019	0.1065	181.04	0.5330	0.3634	0.6451	34.28
3.50	-0.1059	-0.0002	0.1059	180.08	0.5416	0.3600	0.6504	33.61
3.55	-0.1054	0.0015	0.1054	179.16	0.5499	0.3566	0.6554	32.97
3.60	-0.1048	0.0032	0.1048	178.27	0.5578	0.3532	0.6602	32.34
3.65	-0.1041	0.0047	0.1042	177.42	0.5654	0.3497	0.6648	31.74
3.70	-0.1034	0.0061	0.1036	176.60	0.5728	0.3462	0.6693	31.15
3.75	-0.1027	0.0075	0.1030	175.82	0.5798	0.3428	0.6736	30.59
3.80	-0.1020	0.0088	0.1024	175.06	0.5867	0.3393	0.6777	30.04
3.85	-0.1012	0.0100	0.1017	174.33	0.5932	0.3359	0.6817	29.52
3.90	-0.1004	0.0112	0.1011	173.63	0.5996	0.3325	0.6856	29.01
3.95	-0.0997	0.0123	0.1004	172.95	0.6057	0.3291	0.6893	28.52

$k = 0.4$ $\sigma = 0.00$									
a	$\frac{1-\sigma^2}{2}\cdot X$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	1.2738	-0.6785	0.8580	1.5690	0.2083	1.0989	-0.0134	1.0990	359.30
4.05	1.2728	-0.6649	0.8593	1.5422	0.2139	1.0981	-0.0143	1.0982	359.25
4.10	1.2717	-0.6518	0.8606	1.5164	0.2195	1.0973	-0.0153	1.0974	359.20
4.15	1.2706	-0.6392	0.8618	1.4914	0.2251	1.0965	-0.0162	1.0966	359.16
4.20	1.2694	-0.6271	0.8630	1.4673	0.2305	1.0957	-0.0170	1.0958	359.11
4.25	1.2682	-0.6154	0.8642	1.4440	0.2360	1.0949	-0.0178	1.0951	359.07
4.30	1.2670	-0.6042	0.8654	1.4214	0.2414	1.0941	-0.0185	1.0943	359.03
4.35	1.2657	-0.5933	0.8665	1.3996	0.2467	1.0934	-0.0193	1.0935	358.99
4.40	1.2644	-0.5828	0.8677	1.3785	0.2520	1.0926	-0.0199	1.0928	358.95
4.45	1.2630	-0.5727	0.8688	1.3580	0.2572	1.0918	-0.0206	1.0920	358.92
4.50	1.2616	-0.5629	0.8699	1.3382	0.2623	1.0911	-0.0212	1.0913	358.89
4.55	1.2602	-0.5535	0.8709	1.3190	0.2674	1.0903	-0.0217	1.0905	358.86
4.60	1.2588	-0.5443	0.8720	1.3003	0.2724	1.0896	-0.0223	1.0898	358.83
4.65	1.2573	-0.5355	0.8730	1.2822	0.2774	1.0888	-0.0228	1.0891	358.80
4.70	1.2559	-0.5269	0.8741	1.2647	0.2823	1.0881	-0.0233	1.0883	358.77
4.75	1.2544	-0.5186	0.8751	1.2476	0.2872	1.0874	-0.0238	1.0876	358.75
4.80	1.2529	-0.5105	0.8761	1.2310	0.2920	1.0867	-0.0242	1.0869	358.72
4.85	1.2513	-0.5027	0.8771	1.2149	0.2967	1.0859	-0.0246	1.0862	358.70
4.90	1.2498	-0.4951	0.8781	1.1992	0.3014	1.0853	-0.0250	1.0855	358.68
4.95	1.2483	-0.4877	0.8790	1.1839	0.3061	1.0846	-0.0254	1.0849	358.66
5.00	1.2467	-0.4806	0.8800	1.1691	0.3107	1.0839	-0.0258	1.0842	358.64
5.05	1.2452	-0.4736	0.8809	1.1546	0.3152	1.0832	-0.0261	1.0835	358.62
5.10	1.2436	-0.4668	0.8818	1.1404	0.3197	1.0825	-0.0265	1.0829	358.60
5.15	1.2420	-0.4602	0.8827	1.1267	0.3241	1.0819	-0.0268	1.0822	358.58
5.20	1.2405	-0.4538	0.8836	1.1132	0.3285	1.0812	-0.0271	1.0816	358.57
5.25	1.2389	-0.4476	0.8845	1.1001	0.3328	1.0806	-0.0273	1.0810	358.55
5.30	1.2374	-0.4415	0.8854	1.0873	0.3371	1.0800	-0.0276	1.0803	358.54
5.35	1.2358	-0.4356	0.8863	1.0748	0.3414	1.0793	-0.0279	1.0797	358.52
5.40	1.2342	-0.4298	0.8872	1.0626	0.3455	1.0787	-0.0281	1.0791	358.51
5.45	1.2327	-0.4241	0.8880	1.0507	0.3497	1.0781	-0.0283	1.0785	358.49
5.50	1.2311	-0.4186	0.8888	1.0390	0.3538	1.0775	-0.0286	1.0779	358.48
5.55	1.2296	-0.4133	0.8897	1.0276	0.3579	1.0769	-0.0288	1.0773	358.47
5.60	1.2281	-0.4080	0.8905	1.0165	0.3619	1.0763	-0.0290	1.0767	358.46
5.65	1.2266	-0.4029	0.8913	1.0055	0.3659	1.0758	-0.0291	1.0761	358.45
5.70	1.2250	-0.3979	0.8921	0.9948	0.3698	1.0752	-0.0293	1.0756	358.44
5.75	1.2235	-0.3930	0.8929	0.9844	0.3737	1.0746	-0.0295	1.0750	358.43
5.80	1.2221	-0.3882	0.8937	0.9741	0.3775	1.0741	-0.0296	1.0745	358.42
5.85	1.2206	-0.3836	0.8944	0.9640	0.3813	1.0735	-0.0298	1.0739	358.41
5.90	1.2191	-0.3790	0.8952	0.9542	0.3851	1.0730	-0.0299	1.0734	358.40
5.95	1.2176	-0.3746	0.8959	0.9445	0.3889	1.0724	-0.0300	1.0728	358.40
6.00	1.2162	-0.3702	0.8967	0.9351	0.3926	1.0719	-0.0302	1.0723	358.39
6.05	1.2148	-0.3659	0.8974	0.9258	0.3962	1.0713	-0.0303	1.0718	358.38
6.10	1.2133	-0.3617	0.8981	0.9167	0.3999	1.0708	-0.0304	1.0713	358.37
6.15	1.2119	-0.3576	0.8988	0.9077	0.4034	1.0703	-0.0305	1.0707	358.37
6.20	1.2105	-0.3536	0.8995	0.8990	0.4070	1.0698	-0.0306	1.0702	358.36
6.25	1.2092	-0.3497	0.9002	0.8904	0.4105	1.0693	-0.0307	1.0697	358.36
6.30	1.2078	-0.3459	0.9009	0.8819	0.4140	1.0688	-0.0307	1.0692	358.35
6.35	1.2064	-0.3421	0.9016	0.8736	0.4174	1.0683	-0.0308	1.0687	358.35
6.40	1.2051	-0.3384	0.9023	0.8655	0.4209	1.0678	-0.0309	1.0683	358.34
6.45	1.2038	-0.3348	0.9029	0.8575	0.4242	1.0673	-0.0310	1.0678	358.34
6.50	1.2024	-0.3312	0.9036	0.8496	0.4276	1.0669	-0.0310	1.0673	358.34
6.55	1.2011	-0.3278	0.9042	0.8419	0.4309	1.0664	-0.0311	1.0668	358.33
6.60	1.1998	-0.3244	0.9048	0.8343	0.4342	1.0659	-0.0311	1.0664	358.33
6.65	1.1986	-0.3210	0.9055	0.8268	0.4374	1.0655	-0.0312	1.0659	358.33
6.70	1.1973	-0.3177	0.9061	0.8195	0.4407	1.0650	-0.0312	1.0655	358.32
6.75	1.1961	-0.3145	0.9067	0.8123	0.4438	1.0646	-0.0312	1.0650	358.32
6.80	1.1948	-0.3114	0.9073	0.8052	0.4470	1.0641	-0.0313	1.0646	358.32
6.85	1.1936	-0.3083	0.9079	0.7982	0.4501	1.0637	-0.0313	1.0642	358.32
6.90	1.1924	-0.3052	0.9085	0.7914	0.4532	1.0633	-0.0313	1.0637	358.31
6.95	1.1912	-0.3022	0.9091	0.7847	0.4563	1.0628	-0.0313	1.0633	358.31

	$k = 0.4$				$\sigma = 0.00$			
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	-0.0989	0.0134	0.0998	172.30	0.6116	0.3257	0.6929	28.04
4.05	-0.0981	0.0143	0.0991	171.68	0.6173	0.3224	0.6964	27.58
4.10	-0.0973	0.0153	0.0985	171.07	0.6228	0.3192	0.6998	27.14
4.15	-0.0965	0.0162	0.0978	170.49	0.6281	0.3160	0.7031	26.71
4.20	-0.0957	0.0170	0.0972	169.93	0.6332	0.3128	0.7063	26.29
4.25	-0.0949	0.0178	0.0966	169.38	0.6382	0.3097	0.7094	25.89
4.30	-0.0941	0.0185	0.0959	168.85	0.6431	0.3066	0.7124	25.49
4.35	-0.0934	0.0193	0.0953	168.34	0.6477	0.3036	0.7154	25.12
4.40	-0.0926	0.0199	0.0947	167.85	0.6523	0.3007	0.7183	24.75
4.45	-0.0918	0.0206	0.0941	167.37	0.6567	0.2978	0.7211	24.39
4.50	-0.0911	0.0212	0.0935	166.91	0.6610	0.2949	0.7238	24.05
4.55	-0.0903	0.0217	0.0929	166.46	0.6652	0.2922	0.7265	23.71
4.60	-0.0896	0.0223	0.0923	166.02	0.6693	0.2894	0.7292	23.38
4.65	-0.0888	0.0228	0.0917	165.60	0.6732	0.2867	0.7317	23.07
4.70	-0.0881	0.0233	0.0911	165.18	0.6771	0.2841	0.7343	22.76
4.75	-0.0874	0.0238	0.0905	164.78	0.6808	0.2815	0.7367	22.46
4.80	-0.0867	0.0242	0.0900	164.39	0.6845	0.2789	0.7392	22.17
4.85	-0.0859	0.0246	0.0894	164.01	0.6881	0.2764	0.7415	21.89
4.90	-0.0853	0.0250	0.0889	163.63	0.6916	0.2740	0.7439	21.61
4.95	-0.0846	0.0254	0.0883	163.27	0.6950	0.2716	0.7462	21.34
5.00	-0.0839	0.0258	0.0878	162.92	0.6983	0.2692	0.7484	21.08
5.05	-0.0832	0.0261	0.0872	162.57	0.7016	0.2669	0.7506	20.82
5.10	-0.0825	0.0265	0.0867	162.23	0.7048	0.2646	0.7528	20.58
5.15	-0.0819	0.0268	0.0862	161.90	0.7079	0.2623	0.7550	20.33
5.20	-0.0812	0.0271	0.0856	161.58	0.7110	0.2601	0.7571	20.09
5.25	-0.0806	0.0273	0.0851	161.26	0.7140	0.2579	0.7591	19.86
5.30	-0.0800	0.0276	0.0846	160.95	0.7169	0.2558	0.7612	19.64
5.35	-0.0793	0.0279	0.0841	160.65	0.7198	0.2537	0.7632	19.41
5.40	-0.0787	0.0281	0.0836	160.36	0.7226	0.2516	0.7652	19.20
5.45	-0.0781	0.0283	0.0831	160.07	0.7254	0.2496	0.7671	18.99
5.50	-0.0775	0.0286	0.0826	159.78	0.7281	0.2476	0.7690	18.78
5.55	-0.0769	0.0288	0.0821	159.50	0.7307	0.2456	0.7709	18.58
5.60	-0.0763	0.0290	0.0816	159.23	0.7333	0.2436	0.7727	18.38
5.65	-0.0758	0.0291	0.0812	158.96	0.7359	0.2417	0.7746	18.18
5.70	-0.0752	0.0293	0.0807	158.70	0.7384	0.2398	0.7764	17.99
5.75	-0.0746	0.0295	0.0802	158.44	0.7409	0.2380	0.7781	17.81
5.80	-0.0741	0.0296	0.0798	158.19	0.7433	0.2361	0.7799	17.62
5.85	-0.0735	0.0298	0.0793	157.94	0.7456	0.2343	0.7816	17.45
5.90	-0.0730	0.0299	0.0788	157.70	0.7480	0.2325	0.7833	17.27
5.95	-0.0724	0.0300	0.0784	157.46	0.7503	0.2308	0.7850	17.10
6.00	-0.0719	0.0302	0.0779	157.23	0.7525	0.2291	0.7866	16.93
6.05	-0.0713	0.0303	0.0775	157.00	0.7547	0.2273	0.7882	16.76
6.10	-0.0708	0.0304	0.0771	156.78	0.7569	0.2257	0.7898	16.60
6.15	-0.0703	0.0305	0.0766	156.56	0.7590	0.2240	0.7914	16.44
6.20	-0.0698	0.0306	0.0762	156.34	0.7611	0.2223	0.7929	16.28
6.25	-0.0693	0.0307	0.0758	156.13	0.7632	0.2207	0.7945	16.13
6.30	-0.0688	0.0307	0.0754	155.92	0.7652	0.2191	0.7960	15.98
6.35	-0.0683	0.0308	0.0749	155.71	0.7672	0.2175	0.7975	15.83
6.40	-0.0678	0.0309	0.0745	155.51	0.7692	0.2160	0.7989	15.69
6.45	-0.0673	0.0310	0.0741	155.31	0.7711	0.2145	0.8004	15.54
6.50	-0.0669	0.0310	0.0737	155.12	0.7730	0.2129	0.8018	15.40
6.55	-0.0664	0.0311	0.0733	154.93	0.7748	0.2114	0.8032	15.26
6.60	-0.0659	0.0311	0.0729	154.74	0.7767	0.2100	0.8046	15.13
6.65	-0.0655	0.0312	0.0725	154.55	0.7785	0.2085	0.8059	14.99
6.70	-0.0650	0.0312	0.0721	154.37	0.7803	0.2071	0.8073	14.86
6.75	-0.0646	0.0312	0.0717	154.20	0.7820	0.2056	0.8086	14.73
6.80	-0.0641	0.0313	0.0713	154.02	0.7837	0.2042	0.8099	14.61
6.85	-0.0637	0.0313	0.0710	153.85	0.7854	0.2028	0.8112	14.48
6.90	-0.0633	0.0313	0.0706	153.68	0.7871	0.2015	0.8125	14.36
6.95	-0.0628	0.0313	0.0702	153.51	0.7887	0.2001	0.8137	14.24

$k = 0.4$ $\sigma = 0.00$									
a	$\frac{1-\sigma^2}{2} \cdot x$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	1.1900	-0.2993	0.9096	0.7780	0.4593	1.0624	-0.0313	1.0629	358.31
7.05	1.1888	-0.2964	0.9102	0.7715	0.4623	1.0620	-0.0313	1.0625	358.31
7.10	1.1877	-0.2936	0.9108	0.7651	0.4653	1.0616	-0.0313	1.0621	358.31
7.15	1.1865	-0.2908	0.9113	0.7588	0.4682	1.0612	-0.0313	1.0616	358.31
7.20	1.1854	-0.2881	0.9119	0.7526	0.4712	1.0608	-0.0313	1.0612	358.31
7.25	1.1843	-0.2854	0.9124	0.7464	0.4740	1.0604	-0.0313	1.0608	358.31
7.30	1.1832	-0.2828	0.9129	0.7404	0.4769	1.0600	-0.0313	1.0605	358.31
7.35	1.1821	-0.2802	0.9135	0.7345	0.4797	1.0596	-0.0313	1.0601	358.31
7.40	1.1810	-0.2777	0.9140	0.7287	0.4826	1.0592	-0.0313	1.0597	358.31
7.45	1.1799	-0.2752	0.9145	0.7229	0.4853	1.0588	-0.0313	1.0593	358.31
7.50	1.1789	-0.2727	0.9150	0.7173	0.4881	1.0585	-0.0313	1.0589	358.31
7.55	1.1778	-0.2703	0.9155	0.7117	0.4908	1.0581	-0.0313	1.0586	358.31
7.60	1.1768	-0.2679	0.9160	0.7062	0.4935	1.0577	-0.0312	1.0582	358.31
7.65	1.1757	-0.2656	0.9165	0.7008	0.4962	1.0574	-0.0312	1.0578	358.31
7.70	1.1747	-0.2633	0.9170	0.6955	0.4988	1.0570	-0.0312	1.0575	358.31
7.75	1.1737	-0.2610	0.9175	0.6902	0.5015	1.0567	-0.0312	1.0571	358.31
7.80	1.1727	-0.2588	0.9179	0.6851	0.5041	1.0563	-0.0311	1.0568	358.31
7.85	1.1717	-0.2566	0.9184	0.6800	0.5066	1.0560	-0.0311	1.0564	358.31
7.90	1.1708	-0.2545	0.9189	0.6749	0.5092	1.0556	-0.0311	1.0561	358.31
7.95	1.1698	-0.2523	0.9193	0.6700	0.5117	1.0553	-0.0310	1.0557	358.32
8.00	1.1688	-0.2503	0.9198	0.6651	0.5142	1.0550	-0.0310	1.0554	358.32
8.05	1.1679	-0.2482	0.9202	0.6603	0.5167	1.0546	-0.0310	1.0551	358.32
8.10	1.1669	-0.2462	0.9207	0.6556	0.5191	1.0543	-0.0309	1.0548	358.32
8.15	1.1660	-0.2442	0.9211	0.6509	0.5216	1.0540	-0.0309	1.0544	358.32
8.20	1.1651	-0.2422	0.9215	0.6463	0.5240	1.0537	-0.0308	1.0541	358.32
8.25	1.1642	-0.2403	0.9220	0.6417	0.5264	1.0533	-0.0308	1.0538	358.33
8.30	1.1633	-0.2384	0.9224	0.6372	0.5287	1.0530	-0.0308	1.0535	358.33
8.35	1.1624	-0.2365	0.9228	0.6328	0.5311	1.0527	-0.0307	1.0532	358.33
8.40	1.1615	-0.2347	0.9232	0.6285	0.5334	1.0524	-0.0307	1.0529	358.33
8.45	1.1607	-0.2329	0.9236	0.6242	0.5357	1.0521	-0.0306	1.0526	358.33
8.50	1.1598	-0.2311	0.9240	0.6199	0.5380	1.0518	-0.0306	1.0523	358.34
8.55	1.1589	-0.2293	0.9244	0.6157	0.5403	1.0515	-0.0305	1.0520	358.34
8.60	1.1581	-0.2276	0.9248	0.6116	0.5425	1.0512	-0.0305	1.0517	358.34
8.65	1.1573	-0.2259	0.9252	0.6075	0.5447	1.0509	-0.0304	1.0514	358.34
8.70	1.1564	-0.2242	0.9256	0.6035	0.5469	1.0507	-0.0304	1.0511	358.34
8.75	1.1556	-0.2225	0.9260	0.5995	0.5491	1.0504	-0.0303	1.0508	358.35
8.80	1.1548	-0.2209	0.9264	0.5956	0.5512	1.0501	-0.0303	1.0505	358.35
8.85	1.1540	-0.2193	0.9268	0.5917	0.5534	1.0498	-0.0302	1.0503	358.35
8.90	1.1532	-0.2177	0.9271	0.5879	0.5555	1.0496	-0.0301	1.0500	358.36
8.95	1.1524	-0.2161	0.9275	0.5841	0.5576	1.0493	-0.0301	1.0497	358.36
9.00	1.1516	-0.2146	0.9279	0.5804	0.5597	1.0490	-0.0300	1.0494	358.36
9.05	1.1508	-0.2130	0.9282	0.5767	0.5618	1.0487	-0.0300	1.0492	358.36
9.10	1.1501	-0.2115	0.9286	0.5730	0.5638	1.0485	-0.0299	1.0489	358.37
9.15	1.1493	-0.2101	0.9289	0.5695	0.5658	1.0482	-0.0299	1.0487	358.37
9.20	1.1486	-0.2086	0.9293	0.5659	0.5678	1.0480	-0.0298	1.0484	358.37
9.25	1.1478	-0.2071	0.9296	0.5624	0.5698	1.0477	-0.0297	1.0481	358.37
9.30	1.1471	-0.2057	0.9300	0.5589	0.5718	1.0475	-0.0297	1.0479	358.38
9.35	1.1464	-0.2043	0.9303	0.5555	0.5738	1.0472	-0.0296	1.0476	358.38
9.40	1.1456	-0.2029	0.9307	0.5521	0.5757	1.0470	-0.0296	1.0474	358.38
9.45	1.1449	-0.2015	0.9310	0.5488	0.5776	1.0467	-0.0295	1.0471	358.39
9.50	1.1442	-0.2002	0.9313	0.5455	0.5796	1.0465	-0.0294	1.0469	358.39
9.55	1.1435	-0.1988	0.9317	0.5422	0.5814	1.0462	-0.0294	1.0467	358.39
9.60	1.1428	-0.1975	0.9320	0.5390	0.5833	1.0460	-0.0293	1.0464	358.40
9.65	1.1421	-0.1962	0.9323	0.5358	0.5852	1.0458	-0.0292	1.0462	358.40
9.70	1.1414	-0.1949	0.9326	0.5327	0.5870	1.0455	-0.0292	1.0459	358.40
9.75	1.1407	-0.1937	0.9329	0.5296	0.5889	1.0453	-0.0291	1.0457	358.40
9.80	1.1401	-0.1924	0.9333	0.5265	0.5907	1.0451	-0.0291	1.0455	358.41
9.85	1.1394	-0.1912	0.9336	0.5235	0.5925	1.0449	-0.0290	1.0453	358.41
9.90	1.1387	-0.1900	0.9339	0.5204	0.5943	1.0446	-0.0289	1.0450	358.41
9.95	1.1381	-0.1887	0.9342	0.5175	0.5960	1.0444	-0.0289	1.0448	358.42
10.00	1.1374	-0.1875	0.9345	0.5145	0.5978	1.0442	-0.0288	1.0446	358.42

a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
$k=$ 0.4 $\sigma=$ 0.00								
7.00	-0.0624	0.0313	0.0698	153.35	0.7903	0.1988	0.8149	14.12
7.05	-0.0620	0.0313	0.0695	153.19	0.7919	0.1975	0.8162	14.00
7.10	-0.0616	0.0313	0.0691	153.03	0.7935	0.1962	0.8174	13.89
7.15	-0.0612	0.0313	0.0687	152.87	0.7950	0.1949	0.8186	13.77
7.20	-0.0608	0.0313	0.0684	152.72	0.7965	0.1936	0.8197	13.66
7.25	-0.0604	0.0313	0.0680	152.57	0.7980	0.1923	0.8209	13.55
7.30	-0.0600	0.0313	0.0677	152.42	0.7995	0.1911	0.8220	13.44
7.35	-0.0596	0.0313	0.0673	152.28	0.8010	0.1899	0.8232	13.34
7.40	-0.0592	0.0313	0.0670	152.13	0.8024	0.1886	0.8243	13.23
7.45	-0.0588	0.0313	0.0666	151.99	0.8038	0.1874	0.8254	13.13
7.50	-0.0585	0.0313	0.0663	151.85	0.8052	0.1863	0.8265	13.03
7.55	-0.0581	0.0313	0.0660	151.71	0.8066	0.1851	0.8275	12.92
7.60	-0.0577	0.0312	0.0656	151.58	0.8079	0.1839	0.8286	12.83
7.65	-0.0574	0.0312	0.0653	151.45	0.8092	0.1828	0.8296	12.73
7.70	-0.0570	0.0312	0.0650	151.32	0.8106	0.1817	0.8307	12.63
7.75	-0.0567	0.0312	0.0647	151.19	0.8118	0.1805	0.8317	12.54
7.80	-0.0563	0.0311	0.0643	151.06	0.8131	0.1794	0.8327	12.44
7.85	-0.0560	0.0311	0.0640	150.94	0.8144	0.1784	0.8337	12.35
7.90	-0.0556	0.0311	0.0637	150.81	0.8156	0.1773	0.8347	12.26
7.95	-0.0553	0.0310	0.0634	150.69	0.8168	0.1762	0.8356	12.17
8.00	-0.0550	0.0310	0.0631	150.57	0.8181	0.1752	0.8366	12.09
8.05	-0.0546	0.0310	0.0628	150.46	0.8192	0.1741	0.8375	12.00
8.10	-0.0543	0.0309	0.0625	150.34	0.8204	0.1731	0.8385	11.91
8.15	-0.0540	0.0309	0.0622	150.23	0.8216	0.1721	0.8394	11.83
8.20	-0.0537	0.0308	0.0619	150.11	0.8227	0.1711	0.8403	11.75
8.25	-0.0533	0.0308	0.0616	150.00	0.8239	0.1701	0.8412	11.66
8.30	-0.0530	0.0308	0.0613	149.89	0.8250	0.1691	0.8421	11.58
8.35	-0.0527	0.0307	0.0610	149.78	0.8261	0.1681	0.8430	11.50
8.40	-0.0524	0.0307	0.0607	149.68	0.8272	0.1671	0.8439	11.42
8.45	-0.0521	0.0306	0.0604	149.57	0.8282	0.1662	0.8447	11.35
8.50	-0.0518	0.0306	0.0602	149.47	0.8293	0.1652	0.8456	11.27
8.55	-0.0515	0.0305	0.0599	149.37	0.8303	0.1643	0.8464	11.19
8.60	-0.0512	0.0305	0.0596	149.27	0.8314	0.1634	0.8473	11.12
8.65	-0.0509	0.0304	0.0593	149.17	0.8324	0.1625	0.8481	11.05
8.70	-0.0507	0.0304	0.0591	149.07	0.8334	0.1616	0.8489	10.97
8.75	-0.0504	0.0303	0.0588	148.97	0.8344	0.1607	0.8497	10.90
8.80	-0.0501	0.0303	0.0585	148.88	0.8354	0.1598	0.8505	10.83
8.85	-0.0498	0.0302	0.0583	148.78	0.8364	0.1589	0.8513	10.76
8.90	-0.0496	0.0301	0.0580	148.69	0.8373	0.1581	0.8521	10.69
8.95	-0.0493	0.0301	0.0577	148.60	0.8383	0.1572	0.8529	10.62
9.00	-0.0490	0.0300	0.0575	148.51	0.8392	0.1564	0.8536	10.55
9.05	-0.0487	0.0300	0.0572	148.42	0.8401	0.1555	0.8544	10.49
9.10	-0.0485	0.0299	0.0570	148.33	0.8411	0.1547	0.8552	10.42
9.15	-0.0482	0.0299	0.0567	148.24	0.8420	0.1539	0.8559	10.36
9.20	-0.0480	0.0298	0.0565	148.16	0.8429	0.1531	0.8566	10.29
9.25	-0.0477	0.0297	0.0562	148.07	0.8437	0.1523	0.8574	10.23
9.30	-0.0475	0.0297	0.0560	147.99	0.8446	0.1515	0.8581	10.17
9.35	-0.0472	0.0296	0.0557	147.90	0.8455	0.1507	0.8588	10.11
9.40	-0.0470	0.0296	0.0555	147.82	0.8463	0.1499	0.8595	10.04
9.45	-0.0467	0.0295	0.0553	147.74	0.8472	0.1491	0.8602	9.98
9.50	-0.0465	0.0294	0.0550	147.66	0.8480	0.1484	0.8609	9.92
9.55	-0.0462	0.0294	0.0548	147.58	0.8488	0.1476	0.8616	9.86
9.60	-0.0460	0.0293	0.0545	147.50	0.8497	0.1469	0.8623	9.81
9.65	-0.0458	0.0292	0.0543	147.43	0.8505	0.1461	0.8629	9.75
9.70	-0.0455	0.0292	0.0541	147.35	0.8513	0.1454	0.8636	9.69
9.75	-0.0453	0.0291	0.0539	147.28	0.8521	0.1447	0.8643	9.64
9.80	-0.0451	0.0291	0.0536	147.20	0.8528	0.1439	0.8649	9.58
9.85	-0.0449	0.0290	0.0534	147.13	0.8536	0.1432	0.8656	9.52
9.90	-0.0446	0.0289	0.0532	147.05	0.8544	0.1425	0.8662	9.47
9.95	-0.0444	0.0289	0.0530	146.98	0.8551	0.1418	0.8668	9.42
10.00	-0.0442	0.0288	0.0527	146.91	0.8559	0.1411	0.8675	9.36

	$k = 0.4$		$\sigma = 0.25$						
a	$\frac{1-\sigma^2}{2} \cdot X$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.1127	-7.9894	0.4668	5.4687	0.0042	1.0050	0.0146	1.0052	0.83
1.05	1.1130	-7.2446	0.4867	5.3916	0.0046	1.0061	0.0159	1.0062	0.91
1.10	1.1133	-6.5989	0.5062	5.3119	0.0049	1.0073	0.0172	1.0074	0.98
1.15	1.1137	-6.0353	0.5252	5.2298	0.0054	1.0086	0.0184	1.0088	1.05
1.20	1.1141	-5.5405	0.5437	5.1456	0.0058	1.0101	0.0196	1.0103	1.11
1.25	1.1146	-5.1037	0.5617	5.0591	0.0064	1.0118	0.0208	1.0120	1.18
1.30	1.1151	-4.7162	0.5792	4.9708	0.0069	1.0136	0.0219	1.0139	1.24
1.35	1.1157	-4.3708	0.5962	4.8808	0.0076	1.0156	0.0228	1.0159	1.29
1.40	1.1163	-4.0615	0.6127	4.7892	0.0083	1.0178	0.0237	1.0181	1.33
1.45	1.1171	-3.7835	0.6286	4.6963	0.0091	1.0202	0.0244	1.0205	1.37
1.50	1.1179	-3.5327	0.6439	4.6021	0.0100	1.0227	0.0249	1.0230	1.39
1.55	1.1187	-3.3057	0.6588	4.5068	0.0110	1.0253	0.0252	1.0256	1.41
1.60	1.1197	-3.0994	0.6730	4.4108	0.0121	1.0281	0.0253	1.0284	1.41
1.65	1.1207	-2.9115	0.6868	4.3140	0.0134	1.0310	0.0252	1.0313	1.40
1.70	1.1219	-2.7398	0.6999	4.2167	0.0147	1.0340	0.0248	1.0342	1.37
1.75	1.1231	-2.5825	0.7125	4.1192	0.0163	1.0370	0.0241	1.0373	1.33
1.80	1.1244	-2.4380	0.7246	4.0214	0.0179	1.0401	0.0231	1.0404	1.27
1.85	1.1258	-2.3050	0.7361	3.9237	0.0198	1.0432	0.0218	1.0434	1.20
1.90	1.1274	-2.1823	0.7470	3.8262	0.0218	1.0463	0.0202	1.0465	1.11
1.95	1.1290	-2.0689	0.7575	3.7291	0.0240	1.0493	0.0182	1.0494	1.00
2.00	1.1307	-1.9638	0.7673	3.6326	0.0264	1.0522	0.0160	1.0523	0.87
2.05	1.1326	-1.8663	0.7767	3.5367	0.0291	1.0550	0.0134	1.0550	0.73
2.10	1.1345	-1.7757	0.7855	3.4418	0.0320	1.0575	0.0104	1.0576	0.57
2.15	1.1365	-1.6913	0.7938	3.3479	0.0352	1.0599	0.0072	1.0599	0.39
2.20	1.1386	-1.6127	0.8016	3.2553	0.0386	1.0620	0.0038	1.0620	0.20
2.25	1.1408	-1.5393	0.8089	3.1640	0.0423	1.0639	0.0000	1.0639	0.00
2.30	1.1431	-1.4707	0.8157	3.0743	0.0462	1.0654	-0.0039	1.0654	359.79
2.35	1.1454	-1.4065	0.8221	2.9863	0.0505	1.0666	-0.0080	1.0666	359.57
2.40	1.1478	-1.3463	0.8280	2.9000	0.0550	1.0674	-0.0122	1.0675	359.35
2.45	1.1502	-1.2900	0.8335	2.8157	0.0599	1.0679	-0.0165	1.0680	359.11
2.50	1.1527	-1.2371	0.8386	2.7335	0.0650	1.0680	-0.0209	1.0682	358.88
2.55	1.1552	-1.1874	0.8434	2.6534	0.0704	1.0678	-0.0252	1.0681	358.65
2.60	1.1577	-1.1408	0.8477	2.5755	0.0761	1.0672	-0.0295	1.0676	358.42
2.65	1.1602	-1.0969	0.8517	2.5000	0.0821	1.0663	-0.0337	1.0668	358.19
2.70	1.1627	-1.0556	0.8554	2.4268	0.0883	1.0650	-0.0378	1.0657	357.96
2.75	1.1651	-1.0168	0.8588	2.3560	0.0948	1.0635	-0.0418	1.0643	357.75
2.80	1.1675	-0.9801	0.8620	2.2877	0.1015	1.0617	-0.0456	1.0626	357.54
2.85	1.1699	-0.9456	0.8648	2.2218	0.1084	1.0596	-0.0492	1.0608	357.34
2.90	1.1721	-0.9131	0.8674	2.1584	0.1155	1.0574	-0.0526	1.0587	357.15
2.95	1.1743	-0.8823	0.8699	2.0974	0.1228	1.0549	-0.0558	1.0564	356.97
3.00	1.1764	-0.8533	0.8721	2.0387	0.1302	1.0524	-0.0587	1.0540	356.81
3.05	1.1784	-0.8259	0.8741	1.9825	0.1377	1.0497	-0.0615	1.0515	356.65
3.10	1.1803	-0.7999	0.8760	1.9285	0.1454	1.0469	-0.0640	1.0488	356.50
3.15	1.1821	-0.7753	0.8778	1.8767	0.1531	1.0440	-0.0663	1.0461	356.37
3.20	1.1838	-0.7521	0.8794	1.8272	0.1609	1.0411	-0.0683	1.0434	356.25
3.25	1.1853	-0.7301	0.8809	1.7797	0.1687	1.0382	-0.0702	1.0406	356.13
3.30	1.1868	-0.7091	0.8823	1.7342	0.1765	1.0353	-0.0719	1.0378	356.03
3.35	1.1881	-0.6893	0.8836	1.6907	0.1844	1.0324	-0.0733	1.0350	355.94
3.40	1.1893	-0.6705	0.8848	1.6491	0.1922	1.0295	-0.0747	1.0322	355.85
3.45	1.1904	-0.6525	0.8860	1.6092	0.2000	1.0267	-0.0758	1.0295	355.78
3.50	1.1913	-0.6355	0.8871	1.5710	0.2078	1.0238	-0.0768	1.0267	355.71
3.55	1.1922	-0.6193	0.8881	1.5345	0.2156	1.0211	-0.0777	1.0240	355.65
3.60	1.1929	-0.6038	0.8891	1.4995	0.2232	1.0184	-0.0784	1.0214	355.60
3.65	1.1936	-0.5891	0.8901	1.4660	0.2308	1.0157	-0.0791	1.0188	355.55
3.70	1.1941	-0.5750	0.8910	1.4339	0.2384	1.0131	-0.0796	1.0163	355.51
3.75	1.1945	-0.5615	0.8918	1.4032	0.2458	1.0106	-0.0800	1.0138	355.47
3.80	1.1949	-0.5487	0.8927	1.3737	0.2532	1.0082	-0.0804	1.0114	355.44
3.85	1.1951	-0.5364	0.8935	1.3454	0.2604	1.0058	-0.0806	1.0090	355.42
3.90	1.1953	-0.5246	0.8943	1.3182	0.2676	1.0034	-0.0808	1.0067	355.39
3.95	1.1953	-0.5133	0.8951	1.2921	0.2747	1.0012	-0.0810	1.0045	355.38

$k = 0.4$ $\sigma = 0.25$

a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0050	-0.0146	0.0155	250.99	0.0135	0.1078	0.1086	82.86
1.05	-0.0061	-0.0159	0.0170	249.05	0.0164	0.1185	0.1196	82.13
1.10	-0.0073	-0.0172	0.0187	247.03	0.0197	0.1295	0.1310	81.37
1.15	-0.0086	-0.0184	0.0204	244.91	0.0234	0.1410	0.1429	80.58
1.20	-0.0101	-0.0196	0.0221	242.70	0.0276	0.1528	0.1553	79.75
1.25	-0.0118	-0.0208	0.0239	240.41	0.0324	0.1649	0.1681	78.89
1.30	-0.0136	-0.0219	0.0258	238.03	0.0377	0.1773	0.1813	78.00
1.35	-0.0156	-0.0228	0.0277	235.57	0.0436	0.1900	0.1949	77.08
1.40	-0.0178	-0.0237	0.0296	233.03	0.0501	0.2028	0.2089	76.13
1.45	-0.0202	-0.0244	0.0316	230.40	0.0572	0.2157	0.2232	75.15
1.50	-0.0227	-0.0249	0.0337	227.70	0.0650	0.2288	0.2378	74.14
1.55	-0.0253	-0.0252	0.0357	224.91	0.0735	0.2418	0.2528	73.10
1.60	-0.0281	-0.0253	0.0378	222.06	0.0826	0.2549	0.2679	72.04
1.65	-0.0310	-0.0252	0.0399	219.14	0.0925	0.2678	0.2834	70.95
1.70	-0.0340	-0.0248	0.0420	216.15	0.1030	0.2806	0.2990	69.84
1.75	-0.0370	-0.0241	0.0442	213.09	0.1143	0.2932	0.3147	68.71
1.80	-0.0401	-0.0231	0.0463	209.98	0.1262	0.3055	0.3306	67.56
1.85	-0.0432	-0.0218	0.0484	206.80	0.1388	0.3175	0.3465	66.39
1.90	-0.0463	-0.0202	0.0505	203.58	0.1520	0.3290	0.3624	65.20
1.95	-0.0493	-0.0182	0.0525	200.31	0.1659	0.3400	0.3784	63.99
2.00	-0.0522	-0.0160	0.0546	197.00	0.1803	0.3505	0.3942	62.78
2.05	-0.0550	-0.0134	0.0566	193.66	0.1953	0.3605	0.4100	61.55
2.10	-0.0575	-0.0104	0.0585	190.28	0.2108	0.3697	0.4256	60.31
2.15	-0.0599	-0.0072	0.0603	186.88	0.2266	0.3783	0.4410	59.07
2.20	-0.0620	-0.0038	0.0621	183.46	0.2429	0.3861	0.4561	57.83
2.25	-0.0639	-0.0000	0.0639	180.03	0.2594	0.3931	0.4710	56.58
2.30	-0.0654	0.0039	0.0655	176.60	0.2762	0.3993	0.4855	55.33
2.35	-0.0666	0.0080	0.0671	173.17	0.2931	0.4048	0.4997	54.09
2.40	-0.0674	0.0122	0.0685	169.75	0.3101	0.4093	0.5135	52.86
2.45	-0.0679	0.0165	0.0699	166.34	0.3270	0.4131	0.5269	51.63
2.50	-0.0680	0.0209	0.0711	162.96	0.3440	0.4161	0.5398	50.42
2.55	-0.0678	0.0252	0.0723	159.61	0.3607	0.4182	0.5523	49.22
2.60	-0.0672	0.0295	0.0734	156.29	0.3773	0.4196	0.5643	48.04
2.65	-0.0663	0.0337	0.0743	153.02	0.3935	0.4203	0.5757	46.88
2.70	-0.0650	0.0378	0.0752	149.79	0.4095	0.4202	0.5867	45.74
2.75	-0.0635	0.0418	0.0760	146.62	0.4250	0.4195	0.5972	44.62
2.80	-0.0617	0.0456	0.0767	143.51	0.4402	0.4182	0.6072	43.53
2.85	-0.0596	0.0492	0.0773	140.46	0.4549	0.4164	0.6167	42.47
2.90	-0.0574	0.0526	0.0778	137.47	0.4691	0.4141	0.6257	41.43
2.95	-0.0549	0.0558	0.0783	134.56	0.4828	0.4113	0.6342	40.43
3.00	-0.0524	0.0587	0.0787	131.71	0.4960	0.4081	0.6423	39.45
3.05	-0.0497	0.0615	0.0790	128.94	0.5087	0.4046	0.6500	38.50
3.10	-0.0469	0.0640	0.0793	126.24	0.5209	0.4009	0.6572	37.58
3.15	-0.0440	0.0663	0.0796	123.61	0.5325	0.3968	0.6641	36.69
3.20	-0.0411	0.0683	0.0798	121.05	0.5436	0.3926	0.6706	35.84
3.25	-0.0382	0.0702	0.0799	118.58	0.5543	0.3883	0.6767	35.01
3.30	-0.0353	0.0719	0.0801	116.17	0.5645	0.3838	0.6826	34.21
3.35	-0.0324	0.0733	0.0802	113.83	0.5742	0.3792	0.6881	33.44
3.40	-0.0295	0.0747	0.0803	111.57	0.5834	0.3745	0.6933	32.70
3.45	-0.0267	0.0758	0.0804	109.37	0.5923	0.3699	0.6983	31.99
3.50	-0.0238	0.0768	0.0804	107.25	0.6007	0.3652	0.7030	31.30
3.55	-0.0211	0.0777	0.0805	105.19	0.6087	0.3605	0.7075	30.64
3.60	-0.0184	0.0784	0.0805	103.19	0.6164	0.3559	0.7118	30.00
3.65	-0.0157	0.0791	0.0806	101.25	0.6238	0.3512	0.7158	29.38
3.70	-0.0131	0.0796	0.0807	99.38	0.6308	0.3467	0.7198	28.79
3.75	-0.0106	0.0800	0.0807	97.56	0.6375	0.3422	0.7235	28.23
3.80	-0.0082	0.0804	0.0808	95.80	0.6439	0.3377	0.7271	27.68
3.85	-0.0058	0.0806	0.0808	94.10	0.6500	0.3334	0.7305	27.15
3.90	-0.0034	0.0808	0.0809	92.44	0.6559	0.3291	0.7338	26.64
3.95	-0.0012	0.0810	0.0810	90.84	0.6616	0.3249	0.7370	26.15

$k = 0.4$ $\sigma = 0.25$

a	$\frac{1-\sigma^2}{2}\cdot x$ REAL	$\frac{1-\sigma^2}{2}\cdot x$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
4.00	1.1953	-0.5025	0.8959	1.2671	0.2817	0.9990	-0.0811	1.0023	355.36
4.05	1.1953	-0.4922	0.8966	1.2430	0.2885	0.9968	-0.0811	1.0001	355.35
4.10	1.1951	-0.4822	0.8973	1.2198	0.2953	0.9948	-0.0811	0.9981	355.34
4.15	1.1949	-0.4726	0.8981	1.1975	0.3020	0.9928	-0.0811	0.9961	355.33
4.20	1.1946	-0.4634	0.8988	1.1760	0.3085	0.9908	-0.0810	0.9941	355.33
4.25	1.1943	-0.4546	0.8995	1.1553	0.3150	0.9889	-0.0809	0.9922	355.32
4.30	1.1939	-0.4460	0.9002	1.1354	0.3213	0.9870	-0.0807	0.9903	355.32
4.35	1.1934	-0.4378	0.9008	1.1161	0.3276	0.9852	-0.0806	0.9885	355.32
4.40	1.1929	-0.4299	0.9015	1.0975	0.3337	0.9835	-0.0804	0.9868	355.33
4.45	1.1924	-0.4222	0.9022	1.0796	0.3397	0.9818	-0.0802	0.9850	355.33
4.50	1.1918	-0.4148	0.9028	1.0622	0.3457	0.9801	-0.0800	0.9834	355.34
4.55	1.1911	-0.4077	0.9035	1.0455	0.3515	0.9785	-0.0797	0.9817	355.34
4.60	1.1905	-0.4008	0.9041	1.0292	0.3573	0.9769	-0.0795	0.9801	355.35
4.65	1.1898	-0.3941	0.9048	1.0135	0.3629	0.9754	-0.0792	0.9786	355.36
4.70	1.1890	-0.3876	0.9054	0.9983	0.3685	0.9739	-0.0789	0.9771	355.37
4.75	1.1883	-0.3814	0.9060	0.9835	0.3740	0.9724	-0.0787	0.9756	355.38
4.80	1.1875	-0.3753	0.9067	0.9692	0.3794	0.9710	-0.0784	0.9741	355.39
4.85	1.1867	-0.3694	0.9073	0.9553	0.3847	0.9696	-0.0781	0.9727	355.40
4.90	1.1859	-0.3637	0.9079	0.9418	0.3899	0.9682	-0.0778	0.9713	355.41
4.95	1.1850	-0.3582	0.9085	0.9287	0.3951	0.9669	-0.0775	0.9700	355.42
5.00	1.1842	-0.3528	0.9091	0.9160	0.4001	0.9656	-0.0772	0.9687	355.43
5.05	1.1833	-0.3475	0.9097	0.9036	0.4051	0.9643	-0.0768	0.9674	355.44
5.10	1.1824	-0.3425	0.9103	0.8916	0.4100	0.9631	-0.0765	0.9661	355.46
5.15	1.1815	-0.3375	0.9109	0.8798	0.4149	0.9618	-0.0762	0.9649	355.47
5.20	1.1806	-0.3327	0.9115	0.8684	0.4196	0.9606	-0.0759	0.9636	355.48
5.25	1.1797	-0.3280	0.9121	0.8573	0.4243	0.9595	-0.0755	0.9624	355.50
5.30	1.1788	-0.3235	0.9127	0.8464	0.4289	0.9583	-0.0752	0.9613	355.51
5.35	1.1778	-0.3190	0.9132	0.8359	0.4335	0.9572	-0.0749	0.9601	355.53
5.40	1.1769	-0.3147	0.9138	0.8256	0.4380	0.9561	-0.0746	0.9590	355.54
5.45	1.1760	-0.3105	0.9144	0.8155	0.4424	0.9550	-0.0742	0.9579	355.56
5.50	1.1750	-0.3064	0.9149	0.8057	0.4468	0.9540	-0.0739	0.9568	355.57
5.55	1.1741	-0.3024	0.9155	0.7961	0.4511	0.9529	-0.0735	0.9558	355.59
5.60	1.1731	-0.2985	0.9160	0.7867	0.4553	0.9519	-0.0732	0.9547	355.60
5.65	1.1722	-0.2946	0.9165	0.7775	0.4595	0.9509	-0.0729	0.9537	355.62
5.70	1.1713	-0.2909	0.9171	0.7686	0.4637	0.9499	-0.0725	0.9527	355.63
5.75	1.1703	-0.2873	0.9176	0.7598	0.4677	0.9490	-0.0722	0.9517	355.65
5.80	1.1694	-0.2837	0.9181	0.7513	0.4718	0.9480	-0.0719	0.9507	355.67
5.85	1.1684	-0.2802	0.9186	0.7429	0.4757	0.9471	-0.0715	0.9498	355.68
5.90	1.1675	-0.2768	0.9191	0.7347	0.4796	0.9462	-0.0712	0.9488	355.70
5.95	1.1666	-0.2735	0.9196	0.7267	0.4835	0.9453	-0.0708	0.9479	355.71
6.00	1.1657	-0.2703	0.9201	0.7188	0.4873	0.9444	-0.0705	0.9470	355.73
6.05	1.1647	-0.2671	0.9206	0.7111	0.4911	0.9435	-0.0702	0.9461	355.75
6.10	1.1638	-0.2640	0.9211	0.7036	0.4948	0.9427	-0.0698	0.9452	355.76
6.15	1.1629	-0.2609	0.9216	0.6962	0.4985	0.9418	-0.0695	0.9444	355.78
6.20	1.1620	-0.2579	0.9221	0.6890	0.5021	0.9410	-0.0692	0.9435	355.80
6.25	1.1611	-0.2550	0.9225	0.6819	0.5057	0.9402	-0.0688	0.9427	355.81
6.30	1.1602	-0.2522	0.9230	0.6749	0.5092	0.9394	-0.0685	0.9419	355.83
6.35	1.1594	-0.2494	0.9235	0.6681	0.5127	0.9386	-0.0682	0.9411	355.85
6.40	1.1585	-0.2466	0.9239	0.6614	0.5161	0.9378	-0.0678	0.9403	355.86
6.45	1.1576	-0.2440	0.9244	0.6549	0.5195	0.9371	-0.0675	0.9395	355.88
6.50	1.1568	-0.2413	0.9248	0.6484	0.5229	0.9363	-0.0672	0.9387	355.90
6.55	1.1559	-0.2387	0.9252	0.6421	0.5262	0.9356	-0.0668	0.9380	355.91
6.60	1.1551	-0.2362	0.9257	0.6359	0.5295	0.9349	-0.0665	0.9372	355.93
6.65	1.1542	-0.2337	0.9261	0.6298	0.5327	0.9342	-0.0662	0.9365	355.95
6.70	1.1534	-0.2313	0.9265	0.6238	0.5359	0.9335	-0.0659	0.9358	355.96
6.75	1.1526	-0.2289	0.9269	0.6180	0.5390	0.9328	-0.0655	0.9351	355.98
6.80	1.1518	-0.2266	0.9274	0.6122	0.5421	0.9321	-0.0652	0.9344	356.00
6.85	1.1509	-0.2243	0.9278	0.6066	0.5452	0.9314	-0.0649	0.9337	356.01
6.90	1.1501	-0.2221	0.9282	0.6010	0.5483	0.9308	-0.0646	0.9330	356.03
6.95	1.1493	-0.2198	0.9286	0.5955	0.5513	0.9301	-0.0643	0.9324	356.05

	$k = 0.4$			$\sigma = 0.25$				
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.0010	0.0811	0.0811	89.28	0.6670	0.3207	0.7401	25.68
4.05	0.0032	0.0811	0.0812	87.78	0.6722	0.3167	0.7431	25.23
4.10	0.0052	0.0811	0.0813	86.31	0.6772	0.3127	0.7460	24.79
4.15	0.0072	0.0811	0.0814	84.89	0.6821	0.3089	0.7488	24.36
4.20	0.0092	0.0810	0.0815	83.51	0.6867	0.3051	0.7515	23.95
4.25	0.0111	0.0809	0.0816	82.18	0.6912	0.3014	0.7541	23.56
4.30	0.0130	0.0807	0.0818	80.88	0.6956	0.2978	0.7566	23.18
4.35	0.0148	0.0806	0.0819	79.61	0.6998	0.2943	0.7591	22.81
4.40	0.0165	0.0804	0.0821	78.38	0.7038	0.2908	0.7616	22.45
4.45	0.0182	0.0802	0.0822	77.19	0.7078	0.2875	0.7639	22.11
4.50	0.0199	0.0800	0.0824	76.03	0.7116	0.2842	0.7662	21.77
4.55	0.0215	0.0797	0.0826	74.90	0.7153	0.2810	0.7685	21.45
4.60	0.0231	0.0795	0.0828	73.80	0.7189	0.2779	0.7707	21.13
4.65	0.0246	0.0792	0.0830	72.73	0.7224	0.2748	0.7729	20.83
4.70	0.0261	0.0789	0.0832	71.69	0.7258	0.2718	0.7750	20.53
4.75	0.0276	0.0787	0.0834	70.67	0.7291	0.2689	0.7771	20.24
4.80	0.0290	0.0784	0.0836	39.68	0.7323	0.2660	0.7791	19.97
4.85	0.0304	0.0781	0.0838	68.72	0.7354	0.2632	0.7811	19.69
4.90	0.0318	0.0778	0.0840	67.78	0.7385	0.2605	0.7831	19.43
4.95	0.0331	0.0775	0.0843	66.86	0.7415	0.2578	0.7850	19.17
5.00	0.0344	0.0772	0.0845	65.96	0.7444	0.2552	0.7869	18.92
5.05	0.0357	0.0768	0.0847	65.09	0.7472	0.2526	0.7888	18.68
5.10	0.0369	0.0765	0.0850	64.24	0.7500	0.2501	0.7906	18.44
5.15	0.0382	0.0762	0.0852	63.40	0.7527	0.2477	0.7924	18.21
5.20	0.0394	0.0759	0.0855	62.59	0.7553	0.2453	0.7942	17.99
5.25	0.0405	0.0755	0.0857	61.79	0.7579	0.2429	0.7959	17.77
5.30	0.0417	0.0752	0.0860	61.01	0.7605	0.2406	0.7976	17.55
5.35	0.0428	0.0749	0.0863	60.25	0.7629	0.2383	0.7993	17.35
5.40	0.0439	0.0746	0.0865	59.51	0.7654	0.2361	0.8010	17.14
5.45	0.0450	0.0742	0.0868	58.78	0.7678	0.2339	0.8026	16.94
5.50	0.0460	0.0739	0.0871	58.07	0.7701	0.2317	0.8042	16.75
5.55	0.0471	0.0735	0.0873	57.38	0.7724	0.2296	0.8058	16.56
5.60	0.0481	0.0732	0.0876	56.70	0.7746	0.2276	0.8073	16.37
5.65	0.0491	0.0729	0.0879	56.03	0.7768	0.2255	0.8089	16.19
5.70	0.0501	0.0725	0.0881	55.38	0.7790	0.2235	0.8104	16.01
5.75	0.0510	0.0722	0.0884	54.74	0.7811	0.2216	0.8119	15.84
5.80	0.0520	0.0719	0.0887	54.11	0.7831	0.2196	0.8134	15.67
5.85	0.0529	0.0715	0.0890	53.50	0.7852	0.2177	0.8148	15.50
5.90	0.0538	0.0712	0.0892	52.90	0.7872	0.2159	0.8162	15.33
5.95	0.0547	0.0708	0.0895	52.31	0.7891	0.2140	0.8176	15.17
6.00	0.0556	0.0705	0.0898	51.73	0.7910	0.2122	0.8190	15.02
6.05	0.0565	0.0702	0.0901	51.17	0.7929	0.2104	0.8204	14.86
6.10	0.0573	0.0698	0.0904	50.61	0.7948	0.2087	0.8217	14.71
6.15	0.0582	0.0695	0.0906	50.07	0.7966	0.2070	0.8230	14.56
6.20	0.0590	0.0692	0.0909	49.53	0.7984	0.2053	0.8244	14.42
6.25	0.0598	0.0688	0.0912	49.01	0.8001	0.2036	0.8256	14.28
6.30	0.0606	0.0685	0.0915	48.50	0.8019	0.2019	0.8269	14.14
6.35	0.0614	0.0682	0.0917	47.99	0.8036	0.2003	0.8282	14.00
6.40	0.0622	0.0678	0.0920	47.50	0.8052	0.1987	0.8294	13.86
6.45	0.0629	0.0675	0.0923	47.01	0.8069	0.1972	0.8306	13.73
6.50	0.0637	0.0672	0.0925	46.54	0.8085	0.1956	0.8318	13.60
6.55	0.0644	0.0668	0.0928	46.07	0.8101	0.1941	0.8330	13.47
6.60	0.0651	0.0665	0.0931	45.61	0.8116	0.1926	0.8342	13.35
6.65	0.0658	0.0662	0.0934	45.16	0.8131	0.1911	0.8353	13.23
6.70	0.0665	0.0659	0.0936	44.72	0.8147	0.1896	0.8364	13.10
6.75	0.0672	0.0655	0.0939	44.28	0.8161	0.1882	0.8376	12.99
6.80	0.0679	0.0652	0.0941	43.85	0.8176	0.1868	0.8387	12.87
6.85	0.0686	0.0649	0.0944	43.43	0.8190	0.1854	0.8397	12.75
6.90	0.0692	0.0646	0.0947	43.02	0.8204	0.1840	0.8408	12.64
6.95	0.0699	0.0643	0.0949	42.62	0.8218	0.1827	0.8419	12.53

$k = 0.4$ $\sigma = 0.25$									
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	1.1486	-0.2177	0.9290	0.5902	0.5542	0.9295	-0.0640	0.9317	356.06
7.05	1.1478	-0.2156	0.9294	0.5849	0.5572	0.9289	-0.0637	0.9311	356.08
7.10	1.1470	-0.2135	0.9297	0.5797	0.5601	0.9283	-0.0633	0.9304	356.10
7.15	1.1462	-0.2114	0.9301	0.5746	0.5629	0.9276	-0.0630	0.9298	356.11
7.20	1.1455	-0.2094	0.9305	0.5696	0.5658	0.9271	-0.0627	0.9292	356.13
7.25	1.1447	-0.2074	0.9309	0.5647	0.5685	0.9265	-0.0624	0.9286	356.15
7.30	1.1440	-0.2055	0.9312	0.5598	0.5713	0.9259	-0.0621	0.9280	356.16
7.35	1.1433	-0.2036	0.9316	0.5551	0.5740	0.9253	-0.0618	0.9274	356.18
7.40	1.1425	-0.2017	0.9320	0.5504	0.5767	0.9247	-0.0615	0.9268	356.19
7.45	1.1418	-0.1999	0.9323	0.5458	0.5794	0.9242	-0.0612	0.9262	356.21
7.50	1.1411	-0.1981	0.9327	0.5412	0.5820	0.9236	-0.0609	0.9256	356.23
7.55	1.1404	-0.1963	0.9330	0.5368	0.5846	0.9231	-0.0606	0.9251	356.24
7.60	1.1397	-0.1945	0.9333	0.5324	0.5872	0.9226	-0.0604	0.9245	356.26
7.65	1.1390	-0.1928	0.9337	0.5280	0.5898	0.9220	-0.0601	0.9240	356.27
7.70	1.1383	-0.1911	0.9340	0.5238	0.5923	0.9215	-0.0598	0.9235	356.29
7.75	1.1376	-0.1894	0.9344	0.5196	0.5948	0.9210	-0.0595	0.9229	356.30
7.80	1.1369	-0.1878	0.9347	0.5155	0.5972	0.9205	-0.0592	0.9224	356.32
7.85	1.1363	-0.1862	0.9350	0.5114	0.5996	0.9200	-0.0589	0.9219	356.33
7.90	1.1356	-0.1846	0.9353	0.5074	0.6021	0.9195	-0.0587	0.9214	356.35
7.95	1.1350	-0.1831	0.9356	0.5035	0.6044	0.9190	-0.0584	0.9209	356.37
8.00	1.1343	-0.1815	0.9360	0.4996	0.6068	0.9186	-0.0581	0.9204	356.38
8.05	1.1337	-0.1800	0.9363	0.4958	0.6091	0.9181	-0.0578	0.9199	356.40
8.10	1.1330	-0.1785	0.9366	0.4920	0.6114	0.9176	-0.0576	0.9194	356.41
8.15	1.1324	-0.1771	0.9369	0.4883	0.6137	0.9172	-0.0573	0.9189	356.43
8.20	1.1318	-0.1756	0.9372	0.4846	0.6159	0.9167	-0.0570	0.9185	356.44
8.25	1.1311	-0.1742	0.9375	0.4810	0.6181	0.9163	-0.0568	0.9180	356.45
8.30	1.1305	-0.1728	0.9378	0.4775	0.6203	0.9158	-0.0565	0.9176	356.47
8.35	1.1299	-0.1715	0.9381	0.4740	0.6225	0.9154	-0.0562	0.9171	356.48
8.40	1.1293	-0.1701	0.9384	0.4705	0.6247	0.9149	-0.0560	0.9167	356.50
8.45	1.1287	-0.1688	0.9386	0.4671	0.6268	0.9145	-0.0557	0.9162	356.51
8.50	1.1281	-0.1675	0.9389	0.4638	0.6289	0.9141	-0.0555	0.9158	356.53
8.55	1.1276	-0.1662	0.9392	0.4605	0.6310	0.9137	-0.0552	0.9154	356.54
8.60	1.1270	-0.1649	0.9395	0.4572	0.6330	0.9133	-0.0550	0.9149	356.56
8.65	1.1264	-0.1636	0.9398	0.4540	0.6351	0.9129	-0.0547	0.9145	356.57
8.70	1.1258	-0.1624	0.9400	0.4508	0.6371	0.9125	-0.0545	0.9141	356.58
8.75	1.1253	-0.1612	0.9403	0.4477	0.6391	0.9121	-0.0542	0.9137	356.60
8.80	1.1247	-0.1600	0.9406	0.4446	0.6411	0.9117	-0.0540	0.9133	356.61
8.85	1.1242	-0.1588	0.9408	0.4416	0.6430	0.9113	-0.0538	0.9129	356.62
8.90	1.1236	-0.1576	0.9411	0.4386	0.6450	0.9109	-0.0535	0.9125	356.64
8.95	1.1231	-0.1565	0.9414	0.4356	0.6469	0.9106	-0.0533	0.9121	356.65
9.00	1.1225	-0.1553	0.9416	0.4327	0.6488	0.9102	-0.0530	0.9117	356.66
9.05	1.1220	-0.1542	0.9419	0.4298	0.6506	0.9098	-0.0528	0.9113	356.68
9.10	1.1215	-0.1531	0.9421	0.4269	0.6525	0.9095	-0.0526	0.9110	356.69
9.15	1.1209	-0.1520	0.9424	0.4241	0.6543	0.9091	-0.0523	0.9106	356.70
9.20	1.1204	-0.1509	0.9426	0.4213	0.6562	0.9087	-0.0521	0.9102	356.72
9.25	1.1199	-0.1499	0.9429	0.4186	0.6580	0.9084	-0.0519	0.9099	356.73
9.30	1.1194	-0.1488	0.9431	0.4159	0.6597	0.9080	-0.0517	0.9095	356.74
9.35	1.1189	-0.1478	0.9433	0.4132	0.6615	0.9077	-0.0514	0.9092	356.76
9.40	1.1184	-0.1468	0.9436	0.4106	0.6633	0.9074	-0.0512	0.9088	356.77
9.45	1.1179	-0.1458	0.9438	0.4080	0.6650	0.9070	-0.0510	0.9085	356.78
9.50	1.1174	-0.1448	0.9440	0.4054	0.6667	0.9067	-0.0508	0.9081	356.79
9.55	1.1169	-0.1438	0.9443	0.4029	0.6684	0.9064	-0.0506	0.9078	356.81
9.60	1.1164	-0.1429	0.9445	0.4004	0.6701	0.9060	-0.0504	0.9074	356.82
9.65	1.1160	-0.1419	0.9447	0.3979	0.6717	0.9057	-0.0501	0.9071	356.83
9.70	1.1155	-0.1410	0.9449	0.3954	0.6734	0.9054	-0.0499	0.9068	356.84
9.75	1.1150	-0.1400	0.9452	0.3930	0.6750	0.9051	-0.0497	0.9065	356.86
9.80	1.1145	-0.1391	0.9454	0.3906	0.6766	0.9048	-0.0495	0.9061	356.87
9.85	1.1141	-0.1382	0.9456	0.3882	0.6782	0.9045	-0.0493	0.9058	356.88
9.90	1.1136	-0.1373	0.9458	0.3859	0.6798	0.9042	-0.0491	0.9055	356.89
9.95	1.1132	-0.1364	0.9460	0.3836	0.6814	0.9039	-0.0489	0.9052	356.90
10.00	1.1127	-0.1356	0.9463	0.3813	0.6830	0.9036	-0.0487	0.9049	356.92

$k = 0.4$ $\sigma = 0.25$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.0705	0.0640	0.0952	42.22	0.8232	0.1813	0.8429	12.42
7.05	0.0711	0.0637	0.0955	41.83	0.8245	0.1800	0.8439	12.31
7.10	0.0717	0.0633	0.0957	41.44	0.8259	0.1787	0.8450	12.21
7.15	0.0724	0.0630	0.0960	41.07	0.8272	0.1774	0.8460	12.11
7.20	0.0729	0.0627	0.0962	40.69	0.8284	0.1761	0.8470	12.00
7.25	0.0735	0.0624	0.0965	40.33	0.8297	0.1749	0.8479	11.90
7.30	0.0741	0.0621	0.0967	39.97	0.8309	0.1737	0.8489	11.80
7.35	0.0747	0.0618	0.0970	39.62	0.8322	0.1724	0.8499	11.71
7.40	0.0753	0.0615	0.0972	39.27	0.8334	0.1712	0.8508	11.61
7.45	0.0758	0.0612	0.0975	38.93	0.8346	0.1701	0.8517	11.52
7.50	0.0764	0.0609	0.0977	38.59	0.8357	0.1689	0.8526	11.43
7.55	0.0769	0.0606	0.0979	38.26	0.8369	0.1677	0.8535	11.33
7.60	0.0774	0.0604	0.0982	37.93	0.8380	0.1666	0.8544	11.24
7.65	0.0780	0.0601	0.0984	37.61	0.8392	0.1655	0.8553	11.16
7.70	0.0785	0.0598	0.0987	37.30	0.8403	0.1644	0.8562	11.07
7.75	0.0790	0.0595	0.0989	36.99	0.8414	0.1633	0.8571	10.98
7.80	0.0795	0.0592	0.0991	36.68	0.8424	0.1622	0.8579	10.90
7.85	0.0800	0.0589	0.0994	36.38	0.8435	0.1611	0.8587	10.82
7.90	0.0805	0.0587	0.0996	36.08	0.8445	0.1601	0.8596	10.73
7.95	0.0810	0.0584	0.0998	35.79	0.8456	0.1590	0.8604	10.65
8.00	0.0814	0.0581	0.1001	35.51	0.8466	0.1580	0.8612	10.57
8.05	0.0819	0.0578	0.1003	35.22	0.8476	0.1570	0.8620	10.49
8.10	0.0824	0.0576	0.1005	34.94	0.8486	0.1560	0.8628	10.42
8.15	0.0828	0.0573	0.1007	34.67	0.8496	0.1550	0.8636	10.34
8.20	0.0833	0.0570	0.1010	34.40	0.8505	0.1540	0.8644	10.27
8.25	0.0837	0.0568	0.1012	34.13	0.8515	0.1531	0.8651	10.19
8.30	0.0842	0.0565	0.1014	33.87	0.8524	0.1521	0.8659	10.12
8.35	0.0846	0.0562	0.1016	33.61	0.8533	0.1512	0.8666	10.05
8.40	0.0851	0.0560	0.1018	33.36	0.8543	0.1503	0.8674	9.98
8.45	0.0855	0.0557	0.1020	33.11	0.8552	0.1493	0.8681	9.91
8.50	0.0859	0.0555	0.1023	32.86	0.8560	0.1484	0.8688	9.84
8.55	0.0863	0.0552	0.1025	32.61	0.8569	0.1475	0.8695	9.77
8.60	0.0867	0.0550	0.1027	32.37	0.8578	0.1466	0.8702	9.70
8.65	0.0871	0.0547	0.1029	32.14	0.8587	0.1458	0.8709	9.64
8.70	0.0875	0.0545	0.1031	31.90	0.8595	0.1449	0.8716	9.57
8.75	0.0879	0.0542	0.1033	31.67	0.8603	0.1441	0.8723	9.51
8.80	0.0883	0.0540	0.1035	31.44	0.8612	0.1432	0.8730	9.44
8.85	0.0887	0.0538	0.1037	31.22	0.8620	0.1424	0.8737	9.38
8.90	0.0891	0.0535	0.1039	31.00	0.8628	0.1415	0.8743	9.32
8.95	0.0894	0.0533	0.1041	30.78	0.8636	0.1407	0.8750	9.26
9.00	0.0898	0.0530	0.1043	30.56	0.8644	0.1399	0.8756	9.19
9.05	0.0902	0.0528	0.1045	30.35	0.8652	0.1391	0.8763	9.14
9.10	0.0905	0.0526	0.1047	30.14	0.8659	0.1383	0.8769	9.08
9.15	0.0909	0.0523	0.1049	29.93	0.8667	0.1376	0.8775	9.02
9.20	0.0913	0.0521	0.1051	29.73	0.8675	0.1368	0.8782	8.96
9.25	0.0916	0.0519	0.1053	29.53	0.8682	0.1360	0.8788	8.90
9.30	0.0920	0.0517	0.1055	29.33	0.8689	0.1353	0.8794	8.85
9.35	0.0923	0.0514	0.1057	29.13	0.8697	0.1345	0.8800	8.79
9.40	0.0926	0.0512	0.1059	28.94	0.8704	0.1338	0.8806	8.74
9.45	0.0930	0.0510	0.1060	28.75	0.8711	0.1330	0.8812	8.68
9.50	0.0933	0.0508	0.1062	28.56	0.8718	0.1323	0.8818	8.63
9.55	0.0936	0.0506	0.1064	28.37	0.8725	0.1316	0.8824	8.58
9.60	0.0940	0.0504	0.1066	28.19	0.8732	0.1309	0.8829	8.53
9.65	0.0943	0.0501	0.1068	28.01	0.8739	0.1302	0.8835	8.47
9.70	0.0946	0.0499	0.1070	27.83	0.8745	0.1295	0.8841	8.42
9.75	0.0949	0.0497	0.1071	27.65	0.8752	0.1288	0.8846	8.37
9.80	0.0952	0.0495	0.1073	27.47	0.8759	0.1281	0.8852	8.32
9.85	0.0955	0.0493	0.1075	27.30	0.8765	0.1275	0.8857	8.27
9.90	0.0958	0.0491	0.1077	27.13	0.8772	0.1268	0.8863	8.23
9.95	0.0961	0.0489	0.1078	26.96	0.8778	0.1261	0.8868	8.18
10.00	0.0964	0.0487	0.1080	26.79	0.8784	0.1255	0.8873	8.13

	$k = 0.4$ $\sigma = 0.50$								
a	$\frac{1-\sigma^2}{2} \cdot X$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.0027	-5.9741	0.5322	5.3165	0.0049	1.0050	-0.0013	1.0050	359.92
1.05	1.0033	-5.4136	0.5543	5.2257	0.0054	1.0060	-0.0018	1.0060	359.90
1.10	1.0040	-4.9274	0.5758	5.1321	0.0059	1.0072	-0.0023	1.0072	359.87
1.15	1.0048	-4.5027	0.5966	5.0357	0.0065	1.0084	-0.0030	1.0084	359.83
1.20	1.0056	-4.1296	0.6169	4.9367	0.0072	1.0099	-0.0039	1.0099	359.78
1.25	1.0067	-3.7998	0.6364	4.8354	0.0079	1.0114	-0.0049	1.0114	359.72
1.30	1.0078	-3.5069	0.6554	4.7319	0.0088	1.0131	-0.0061	1.0131	359.65
1.35	1.0091	-3.2455	0.6736	4.6263	0.0098	1.0149	-0.0076	1.0149	359.57
1.40	1.0105	-3.0112	0.6912	4.5190	0.0109	1.0168	-0.0094	1.0169	359.47
1.45	1.0122	-2.8003	0.7080	4.4100	0.0122	1.0189	-0.0114	1.0189	359.36
1.50	1.0140	-2.6097	0.7242	4.2995	0.0136	1.0209	-0.0138	1.0210	359.22
1.55	1.0160	-2.4368	0.7396	4.1878	0.0152	1.0231	-0.0166	1.0232	359.07
1.60	1.0182	-2.2795	0.7543	4.0750	0.0170	1.0252	-0.0197	1.0254	358.90
1.65	1.0206	-2.1360	0.7683	3.9614	0.0190	1.0272	-0.0233	1.0275	358.70
1.70	1.0233	-2.0046	0.7816	3.8471	0.0213	1.0292	-0.0273	1.0296	358.48
1.75	1.0262	-1.8839	0.7941	3.7323	0.0239	1.0310	-0.0317	1.0315	358.24
1.80	1.0294	-1.7730	0.8059	3.6173	0.0269	1.0327	-0.0366	1.0333	357.97
1.85	1.0329	-1.6706	0.8169	3.5024	0.0301	1.0340	-0.0419	1.0348	357.68
1.90	1.0367	-1.5761	0.8272	3.3877	0.0338	1.0349	-0.0477	1.0360	357.36
1.95	1.0407	-1.4885	0.8367	3.2736	0.0379	1.0355	-0.0538	1.0369	357.02
2.00	1.0451	-1.4074	0.8454	3.1604	0.0424	1.0355	-0.0603	1.0373	356.67
2.05	1.0497	-1.3321	0.8535	3.0484	0.0474	1.0350	-0.0671	1.0371	356.29
2.10	1.0546	-1.2622	0.8608	2.9379	0.0530	1.0338	-0.0741	1.0365	355.90
2.15	1.0597	-1.1971	0.8674	2.8293	0.0591	1.0320	-0.0812	1.0352	355.50
2.20	1.0651	-1.1366	0.8732	2.7228	0.0657	1.0295	-0.0884	1.0332	355.09
2.25	1.0707	-1.0803	0.8785	2.6190	0.0729	1.0262	-0.0954	1.0307	354.69
2.30	1.0764	-1.0278	0.8831	2.5181	0.0806	1.0223	-0.1023	1.0274	354.29
2.35	1.0822	-0.9790	0.8871	2.4204	0.0889	1.0178	-0.1088	1.0236	353.90
2.40	1.0880	-0.9336	0.8906	2.3262	0.0977	1.0127	-0.1150	1.0192	353.52
2.45	1.0939	-0.8913	0.8935	2.2357	0.1069	1.0070	-0.1206	1.0142	353.17
2.50	1.0997	-0.8519	0.8961	2.1491	0.1166	1.0010	-0.1258	1.0088	352.84
2.55	1.1054	-0.8152	0.8982	2.0664	0.1266	0.9946	-0.1304	1.0031	352.53
2.60	1.1109	-0.7811	0.9000	1.9877	0.1370	0.9879	-0.1344	0.9970	352.25
2.65	1.1163	-0.7492	0.9016	1.9130	0.1476	0.9812	-0.1378	0.9908	352.00
2.70	1.1214	-0.7194	0.9028	1.8422	0.1585	0.9743	-0.1407	0.9844	351.78
2.75	1.1263	-0.6917	0.9039	1.7752	0.1694	0.9675	-0.1430	0.9780	351.59
2.80	1.1309	-0.6657	0.9048	1.7119	0.1805	0.9607	-0.1448	0.9716	351.43
2.85	1.1353	-0.6414	0.9055	1.6521	0.1916	0.9541	-0.1462	0.9652	351.29
2.90	1.1395	-0.6186	0.9061	1.5956	0.2028	0.9476	-0.1471	0.9590	351.18
2.95	1.1433	-0.5973	0.9066	1.5423	0.2139	0.9413	-0.1476	0.9528	351.09
3.00	1.1469	-0.5772	0.9071	1.4920	0.2249	0.9353	-0.1478	0.9469	351.02
3.05	1.1502	-0.5584	0.9074	1.4445	0.2359	0.9294	-0.1477	0.9411	350.97
3.10	1.1533	-0.5406	0.9078	1.3996	0.2467	0.9238	-0.1474	0.9355	350.93
3.15	1.1562	-0.5239	0.9081	1.3571	0.2574	0.9184	-0.1469	0.9301	350.92
3.20	1.1588	-0.5081	0.9083	1.3170	0.2680	0.9133	-0.1461	0.9249	350.91
3.25	1.1612	-0.4932	0.9086	1.2789	0.2783	0.9084	-0.1452	0.9199	350.92
3.30	1.1634	-0.4790	0.9088	1.2430	0.2885	0.9037	-0.1442	0.9151	350.93
3.35	1.1654	-0.4657	0.9090	1.2088	0.2985	0.8992	-0.1431	0.9105	350.96
3.40	1.1672	-0.4530	0.9092	1.1765	0.3084	0.8950	-0.1419	0.9061	350.99
3.45	1.1689	-0.4409	0.9094	1.1457	0.3180	0.8909	-0.1406	0.9019	351.03
3.50	1.1704	-0.4295	0.9096	1.1165	0.3274	0.8870	-0.1393	0.8979	351.08
3.55	1.1717	-0.4186	0.9099	1.0887	0.3366	0.8834	-0.1379	0.8941	351.13
3.60	1.1729	-0.4083	0.9101	1.0623	0.3457	0.8799	-0.1365	0.8904	351.18
3.65	1.1739	-0.3984	0.9103	1.0371	0.3545	0.8765	-0.1351	0.8869	351.24
3.70	1.1749	-0.3890	0.9105	1.0130	0.3631	0.8733	-0.1337	0.8835	351.30
3.75	1.1757	-0.3800	0.9107	0.9901	0.3715	0.8703	-0.1322	0.8802	351.36
3.80	1.1764	-0.3714	0.9110	0.9682	0.3798	0.8673	-0.1308	0.8771	351.42
3.85	1.1770	-0.3631	0.9112	0.9472	0.3878	0.8645	-0.1294	0.8742	351.49
3.90	1.1775	-0.3553	0.9115	0.9272	0.3957	0.8619	-0.1280	0.8713	351.55
3.95	1.1779	-0.3477	0.9117	0.9080	0.4033	0.8593	-0.1266	0.8686	351.62

$k = 0.4$ $\sigma = 0.50$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0050	0.0013	0.0052	165.19	0.0155	0.1234	0.1244	82.84
1.05	-0.0060	0.0018	0.0063	163.67	0.0188	0.1357	0.1370	82.11
1.10	-0.0072	0.0023	0.0075	162.07	0.0226	0.1485	0.1502	81.34
1.15	-0.0084	0.0030	0.0090	160.40	0.0270	0.1617	0.1639	80.53
1.20	-0.0099	0.0039	0.0106	158.65	0.0319	0.1753	0.1782	79.69
1.25	-0.0114	0.0049	0.0124	156.83	0.0374	0.1893	0.1930	78.81
1.30	-0.0131	0.0061	0.0145	154.93	0.0437	0.2037	0.2083	77.90
1.35	-0.0149	0.0076	0.0168	152.95	0.0506	0.2183	0.2241	76.95
1.40	-0.0168	0.0094	0.0193	150.90	0.0583	0.2332	0.2404	75.97
1.45	-0.0189	0.0114	0.0220	148.78	0.0668	0.2483	0.2571	74.95
1.50	-0.0209	0.0138	0.0251	146.57	0.0761	0.2635	0.2743	73.90
1.55	-0.0231	0.0166	0.0284	144.29	0.0863	0.2788	0.2918	72.81
1.60	-0.0252	0.0197	0.0320	141.94	0.0973	0.2940	0.3097	71.68
1.65	-0.0272	0.0233	0.0358	139.50	0.1093	0.3091	0.3279	70.52
1.70	-0.0292	0.0273	0.0400	137.00	0.1223	0.3241	0.3464	69.32
1.75	-0.0310	0.0317	0.0444	134.41	0.1362	0.3387	0.3650	68.10
1.80	-0.0327	0.0366	0.0490	131.76	0.1510	0.3529	0.3839	66.83
1.85	-0.0340	0.0419	0.0540	129.04	0.1668	0.3667	0.4029	65.54
1.90	-0.0349	0.0477	0.0591	126.25	0.1835	0.3798	0.4218	64.21
1.95	-0.0355	0.0538	0.0645	123.40	0.2011	0.3922	0.4408	62.85
2.00	-0.0355	0.0603	0.0700	120.49	0.2195	0.4038	0.4596	61.47
2.05	-0.0350	0.0671	0.0757	117.53	0.2387	0.4145	0.4783	60.06
2.10	-0.0338	0.0741	0.0815	114.52	0.2586	0.4240	0.4967	58.63
2.15	-0.0320	0.0812	0.0873	111.49	0.2790	0.4325	0.5146	57.18
2.20	-0.0295	0.0884	0.0931	108.44	0.2998	0.4397	0.5322	55.71
2.25	-0.0262	0.0954	0.0989	105.38	0.3209	0.4456	0.5491	54.24
2.30	-0.0223	0.1023	0.1047	102.32	0.3421	0.4503	0.5655	52.77
2.35	-0.0178	0.1088	0.1102	99.28	0.3633	0.4536	0.5812	51.31
2.40	-0.0127	0.1150	0.1157	96.28	0.3843	0.4556	0.5961	49.85
2.45	-0.0070	0.1206	0.1208	93.33	0.4050	0.4564	0.6102	48.41
2.50	-0.0010	0.1258	0.1258	90.44	0.4253	0.4560	0.6235	47.00
2.55	0.0054	0.1304	0.1305	87.61	0.4449	0.4545	0.6360	45.61
2.60	0.0121	0.1344	0.1349	84.87	0.4639	0.4521	0.6477	44.26
2.65	0.0188	0.1378	0.1391	82.22	0.4821	0.4487	0.6586	42.95
2.70	0.0257	0.1407	0.1430	79.66	0.4995	0.4447	0.6687	41.68
2.75	0.0325	0.1430	0.1466	77.20	0.5160	0.4399	0.6781	40.45
2.80	0.0393	0.1448	0.1500	74.83	0.5318	0.4347	0.6868	39.27
2.85	0.0459	0.1462	0.1532	72.57	0.5467	0.4291	0.6949	38.13
2.90	0.0524	0.1471	0.1561	70.40	0.5607	0.4231	0.7024	37.03
2.95	0.0587	0.1476	0.1588	68.33	0.5740	0.4168	0.7094	35.99
3.00	0.0647	0.1478	0.1614	66.35	0.5865	0.4104	0.7158	34.98
3.05	0.0706	0.1477	0.1637	64.46	0.5983	0.4039	0.7218	34.02
3.10	0.0762	0.1474	0.1659	62.66	0.6093	0.3973	0.7274	33.11
3.15	0.0816	0.1469	0.1680	60.95	0.6198	0.3907	0.7327	32.23
3.20	0.0867	0.1461	0.1699	59.31	0.6296	0.3841	0.7375	31.39
3.25	0.0916	0.1452	0.1717	57.75	0.6388	0.3776	0.7421	30.59
3.30	0.0963	0.1442	0.1734	56.26	0.6475	0.3712	0.7464	29.82
3.35	0.1008	0.1431	0.1750	54.84	0.6557	0.3648	0.7504	29.09
3.40	0.1050	0.1419	0.1765	53.49	0.6635	0.3586	0.7542	28.39
3.45	0.1091	0.1406	0.1780	52.19	0.6708	0.3525	0.7578	27.72
3.50	0.1130	0.1393	0.1793	50.96	0.6777	0.3465	0.7612	27.08
3.55	0.1166	0.1379	0.1806	49.78	0.6843	0.3407	0.7644	26.47
3.60	0.1201	0.1365	0.1819	48.65	0.6905	0.3350	0.7675	25.88
3.65	0.1235	0.1351	0.1830	47.57	0.6964	0.3295	0.7704	25.32
3.70	0.1267	0.1337	0.1842	46.54	0.7020	0.3241	0.7732	24.78
3.75	0.1297	0.1322	0.1853	45.55	0.7073	0.3189	0.7759	24.27
3.80	0.1327	0.1308	0.1863	44.60	0.7124	0.3138	0.7785	23.77
3.85	0.1355	0.1294	0.1873	43.69	0.7173	0.3089	0.7810	23.30
3.90	0.1381	0.1280	0.1883	42.82	0.7219	0.3041	0.7834	22.84
3.95	0.1407	0.1266	0.1893	41.98	0.7264	0.2995	0.7857	22.41

$k = 0.4$ $\sigma = 0.50$									
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	1.1782	-0.3405	0.9120	0.8896	0.4108	0.8569	-0.1252	0.8660	351.69
4.05	1.1785	-0.3335	0.9123	0.8720	0.4181	0.8545	-0.1239	0.8634	351.75
4.10	1.1786	-0.3269	0.9125	0.8551	0.4252	0.8522	-0.1225	0.8610	351.82
4.15	1.1788	-0.3204	0.9128	0.8388	0.4322	0.8500	-0.1212	0.8586	351.89
4.20	1.1788	-0.3143	0.9131	0.8232	0.4390	0.8479	-0.1199	0.8564	351.95
4.25	1.1788	-0.3083	0.9134	0.8082	0.4457	0.8459	-0.1186	0.8542	352.02
4.30	1.1787	-0.3026	0.9137	0.7937	0.4522	0.8440	-0.1174	0.8521	352.08
4.35	1.1786	-0.2971	0.9140	0.7797	0.4585	0.8421	-0.1162	0.8500	352.15
4.40	1.1784	-0.2918	0.9143	0.7663	0.4647	0.8402	-0.1150	0.8481	352.21
4.45	1.1782	-0.2866	0.9146	0.7533	0.4708	0.8385	-0.1138	0.8462	352.27
4.50	1.1780	-0.2817	0.9149	0.7408	0.4767	0.8368	-0.1126	0.8443	352.33
4.55	1.1777	-0.2769	0.9153	0.7287	0.4825	0.8351	-0.1115	0.8425	352.40
4.60	1.1774	-0.2723	0.9156	0.7170	0.4882	0.8335	-0.1104	0.8408	352.46
4.65	1.1770	-0.2678	0.9159	0.7057	0.4938	0.8319	-0.1093	0.8391	352.51
4.70	1.1766	-0.2634	0.9162	0.6948	0.4992	0.8304	-0.1082	0.8374	352.57
4.75	1.1762	-0.2592	0.9166	0.6841	0.5045	0.8289	-0.1072	0.8358	352.63
4.80	1.1758	-0.2551	0.9169	0.6739	0.5097	0.8275	-0.1062	0.8343	352.69
4.85	1.1753	-0.2512	0.9172	0.6639	0.5148	0.8261	-0.1052	0.8328	352.74
4.90	1.1749	-0.2473	0.9176	0.6542	0.5198	0.8247	-0.1042	0.8313	352.80
4.95	1.1744	-0.2436	0.9179	0.6448	0.5247	0.8234	-0.1032	0.8298	352.85
5.00	1.1738	-0.2400	0.9182	0.6357	0.5296	0.8221	-0.1023	0.8284	352.91
5.05	1.1733	-0.2365	0.9186	0.6269	0.5343	0.8208	-0.1014	0.8271	352.96
5.10	1.1728	-0.2330	0.9189	0.6182	0.5389	0.8196	-0.1005	0.8257	353.01
5.15	1.1722	-0.2297	0.9193	0.6099	0.5434	0.8184	-0.0996	0.8244	353.06
5.20	1.1717	-0.2265	0.9196	0.6017	0.5479	0.8172	-0.0987	0.8231	353.11
5.25	1.1711	-0.2233	0.9199	0.5937	0.5523	0.8161	-0.0978	0.8219	353.16
5.30	1.1705	-0.2203	0.9203	0.5860	0.5565	0.8149	-0.0970	0.8207	353.21
5.35	1.1699	-0.2173	0.9206	0.5785	0.5608	0.8138	-0.0961	0.8195	353.26
5.40	1.1693	-0.2143	0.9209	0.5711	0.5649	0.8127	-0.0953	0.8183	353.31
5.45	1.1687	-0.2115	0.9213	0.5640	0.5690	0.8117	-0.0945	0.8172	353.36
5.50	1.1681	-0.2087	0.9216	0.5570	0.5729	0.8107	-0.0937	0.8161	353.40
5.55	1.1675	-0.2060	0.9219	0.5501	0.5769	0.8096	-0.0930	0.8150	353.45
5.60	1.1669	-0.2034	0.9222	0.5435	0.5807	0.8086	-0.0922	0.8139	353.50
5.65	1.1663	-0.2008	0.9226	0.5370	0.5845	0.8077	-0.0914	0.8128	353.54
5.70	1.1657	-0.1983	0.9229	0.5306	0.5883	0.8067	-0.0907	0.8118	353.58
5.75	1.1651	-0.1958	0.9232	0.5244	0.5919	0.8058	-0.0900	0.8108	353.63
5.80	1.1645	-0.1934	0.9235	0.5183	0.5955	0.8049	-0.0893	0.8098	353.67
5.85	1.1639	-0.1911	0.9238	0.5124	0.5991	0.8040	-0.0886	0.8088	353.71
5.90	1.1633	-0.1888	0.9242	0.5066	0.6026	0.8031	-0.0879	0.8079	353.76
5.95	1.1627	-0.1866	0.9245	0.5009	0.6060	0.8022	-0.0872	0.8069	353.80
6.00	1.1620	-0.1844	0.9248	0.4953	0.6094	0.8014	-0.0865	0.8060	353.84
6.05	1.1614	-0.1822	0.9251	0.4899	0.6127	0.8005	-0.0858	0.8051	353.88
6.10	1.1608	-0.1801	0.9254	0.4845	0.6160	0.7997	-0.0852	0.8042	353.92
6.15	1.1602	-0.1781	0.9257	0.4793	0.6192	0.7989	-0.0845	0.8033	353.96
6.20	1.1596	-0.1760	0.9260	0.4742	0.6224	0.7981	-0.0839	0.8025	354.00
6.25	1.1590	-0.1741	0.9263	0.4692	0.6255	0.7973	-0.0833	0.8017	354.04
6.30	1.1584	-0.1721	0.9266	0.4643	0.6286	0.7966	-0.0826	0.8008	354.08
6.35	1.1579	-0.1702	0.9268	0.4595	0.6316	0.7958	-0.0820	0.8000	354.11
6.40	1.1573	-0.1684	0.9271	0.4547	0.6346	0.7951	-0.0814	0.7992	354.15
6.45	1.1567	-0.1666	0.9274	0.4501	0.6376	0.7943	-0.0808	0.7984	354.19
6.50	1.1561	-0.1648	0.9277	0.4456	0.6405	0.7936	-0.0803	0.7977	354.23
6.55	1.1555	-0.1631	0.9280	0.4411	0.6433	0.7929	-0.0797	0.7969	354.26
6.60	1.1550	-0.1614	0.9282	0.4368	0.6461	0.7922	-0.0791	0.7962	354.30
6.65	1.1544	-0.1597	0.9285	0.4325	0.6489	0.7916	-0.0785	0.7954	354.33
6.70	1.1539	-0.1580	0.9288	0.4283	0.6516	0.7909	-0.0780	0.7947	354.37
6.75	1.1533	-0.1564	0.9290	0.4242	0.6543	0.7902	-0.0774	0.7940	354.40
6.80	1.1527	-0.1548	0.9293	0.4201	0.6570	0.7896	-0.0769	0.7933	354.44
6.85	1.1522	-0.1533	0.9296	0.4161	0.6596	0.7890	-0.0764	0.7926	354.47
6.90	1.1517	-0.1518	0.9298	0.4122	0.6622	0.7883	-0.0758	0.7920	354.50
6.95	1.1511	-0.1503	0.9301	0.4084	0.6647	0.7877	-0.0753	0.7913	354.54

$k = 0.4$ $\sigma = 0.50$

α	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.1431	0.1252	0.1902	41.18	0.7306	0.2950	0.7879	21.99
4.05	0.1455	0.1239	0.1911	40.40	0.7347	0.2906	0.7901	21.58
4.10	0.1478	0.1225	0.1920	39.66	0.7387	0.2864	0.7922	21.19
4.15	0.1500	0.1212	0.1928	38.94	0.7424	0.2823	0.7943	20.82
4.20	0.1521	0.1199	0.1936	38.26	0.7461	0.2783	0.7963	20.45
4.25	0.1541	0.1186	0.1945	37.59	0.7496	0.2744	0.7982	20.11
4.30	0.1560	0.1174	0.1953	36.95	0.7530	0.2706	0.8001	19.77
4.35	0.1579	0.1162	0.1961	36.33	0.7563	0.2670	0.8020	19.44
4.40	0.1598	0.1150	0.1968	35.74	0.7594	0.2634	0.8038	19.13
4.45	0.1615	0.1138	0.1976	35.16	0.7625	0.2600	0.8056	18.83
4.50	0.1632	0.1126	0.1983	34.60	0.7655	0.2566	0.8074	18.53
4.55	0.1649	0.1115	0.1991	34.06	0.7684	0.2534	0.8091	18.25
4.60	0.1665	0.1104	0.1998	33.54	0.7712	0.2502	0.8108	17.98
4.65	0.1681	0.1093	0.2005	33.04	0.7739	0.2471	0.8124	17.71
4.70	0.1696	0.1082	0.2012	32.55	0.7766	0.2441	0.8141	17.45
4.75	0.1711	0.1072	0.2019	32.07	0.7792	0.2412	0.8157	17.20
4.80	0.1725	0.1062	0.2026	31.61	0.7817	0.2384	0.8172	16.96
4.85	0.1739	0.1052	0.2032	31.16	0.7842	0.2356	0.8188	16.72
4.90	0.1753	0.1042	0.2039	30.73	0.7866	0.2329	0.8203	16.49
4.95	0.1766	0.1032	0.2046	30.31	0.7889	0.2302	0.8218	16.27
5.00	0.1779	0.1023	0.2052	29.90	0.7912	0.2277	0.8233	16.05
5.05	0.1792	0.1014	0.2059	29.50	0.7934	0.2252	0.8248	15.84
5.10	0.1804	0.1005	0.2065	29.11	0.7956	0.2227	0.8262	15.64
5.15	0.1816	0.0996	0.2071	28.73	0.7978	0.2203	0.8276	15.44
5.20	0.1828	0.0987	0.2077	28.36	0.7998	0.2180	0.8290	15.24
5.25	0.1839	0.0978	0.2083	28.00	0.8019	0.2157	0.8304	15.05
5.30	0.1851	0.0970	0.2089	27.65	0.8039	0.2134	0.8317	14.87
5.35	0.1862	0.0961	0.2095	27.31	0.8059	0.2112	0.8331	14.69
5.40	0.1873	0.0953	0.2101	26.98	0.8078	0.2091	0.8344	14.51
5.45	0.1883	0.0945	0.2107	26.66	0.8097	0.2070	0.8357	14.34
5.50	0.1893	0.0937	0.2113	26.34	0.8115	0.2049	0.8370	14.17
5.55	0.1904	0.0930	0.2118	26.03	0.8133	0.2029	0.8383	14.01
5.60	0.1914	0.0922	0.2124	25.73	0.8151	0.2009	0.8395	13.85
5.65	0.1923	0.0914	0.2130	25.43	0.8169	0.1990	0.8407	13.69
5.70	0.1933	0.0907	0.2135	25.14	0.8186	0.1971	0.8420	13.54
5.75	0.1942	0.0900	0.2141	24.86	0.8203	0.1952	0.8432	13.39
5.80	0.1951	0.0893	0.2146	24.58	0.8219	0.1934	0.8444	13.24
5.85	0.1960	0.0886	0.2151	24.31	0.8235	0.1916	0.8455	13.10
5.90	0.1969	0.0879	0.2156	24.04	0.8251	0.1898	0.8467	12.96
5.95	0.1978	0.0872	0.2162	23.78	0.8267	0.1881	0.8478	12.82
6.00	0.1986	0.0865	0.2167	23.53	0.8282	0.1864	0.8489	12.68
6.05	0.1995	0.0858	0.2172	23.28	0.8297	0.1847	0.8500	12.55
6.10	0.2003	0.0852	0.2177	23.04	0.8312	0.1831	0.8511	12.42
6.15	0.2011	0.0845	0.2182	22.80	0.8327	0.1815	0.8522	12.29
6.20	0.2019	0.0839	0.2186	22.56	0.8341	0.1799	0.8533	12.17
6.25	0.2027	0.0833	0.2191	22.33	0.8355	0.1783	0.8543	12.05
6.30	0.2034	0.0826	0.2196	22.11	0.8369	0.1768	0.8553	11.93
6.35	0.2042	0.0820	0.2201	21.89	0.8382	0.1753	0.8564	11.81
6.40	0.2049	0.0814	0.2205	21.67	0.8396	0.1738	0.8574	11.69
6.45	0.2057	0.0808	0.2210	21.46	0.8409	0.1723	0.8584	11.58
6.50	0.2064	0.0803	0.2214	21.25	0.8422	0.1709	0.8593	11.47
6.55	0.2071	0.0797	0.2219	21.05	0.8434	0.1695	0.8603	11.36
6.60	0.2078	0.0791	0.2223	20.84	0.8447	0.1681	0.8613	11.25
6.65	0.2084	0.0785	0.2228	20.65	0.8459	0.1667	0.8622	11.15
6.70	0.2091	0.0780	0.2232	20.45	0.8471	0.1654	0.8631	11.05
6.75	0.2098	0.0774	0.2236	20.26	0.8483	0.1641	0.8640	10.94
6.80	0.2104	0.0769	0.2240	20.08	0.8495	0.1627	0.8650	10.85
6.85	0.2110	0.0764	0.2244	19.89	0.8507	0.1615	0.8658	10.75
6.90	0.2117	0.0758	0.2248	19.71	0.8518	0.1602	0.8667	10.65
6.95	0.2123	0.0753	0.2253	19.54	0.8529	0.1590	0.8676	10.56

$k = 0.4$ $\sigma = 0.50$

a	$\frac{1-\sigma^2}{2} \cdot x$ REAL	$\frac{1-\sigma^2}{2} \cdot x$ IMAG.	$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
7.00	1.1506	-0.1488	0.9303	0.4046	0.6672	0.7871	-0.0748	0.7907	354.57
7.05	1.1501	-0.1474	0.9306	0.4009	0.6697	0.7865	-0.0743	0.7900	354.60
7.10	1.1495	-0.1460	0.9308	0.3973	0.6721	0.7859	-0.0738	0.7894	354.64
7.15	1.1490	-0.1446	0.9311	0.3937	0.6745	0.7853	-0.0733	0.7888	354.67
7.20	1.1485	-0.1432	0.9313	0.3902	0.6769	0.7848	-0.0728	0.7882	354.70
7.25	1.1480	-0.1419	0.9316	0.3868	0.6793	0.7842	-0.0723	0.7876	354.73
7.30	1.1475	-0.1405	0.9318	0.3834	0.6816	0.7837	-0.0719	0.7870	354.76
7.35	1.1470	-0.1393	0.9320	0.3800	0.6838	0.7831	-0.0714	0.7864	354.79
7.40	1.1465	-0.1380	0.9323	0.3767	0.6861	0.7826	-0.0709	0.7858	354.82
7.45	1.1460	-0.1367	0.9325	0.3735	0.6883	0.7821	-0.0705	0.7852	354.85
7.50	1.1455	-0.1355	0.9327	0.3704	0.6905	0.7815	-0.0700	0.7847	354.88
7.55	1.1450	-0.1343	0.9329	0.3672	0.6927	0.7810	-0.0696	0.7841	354.91
7.60	1.1445	-0.1331	0.9332	0.3642	0.6948	0.7805	-0.0691	0.7836	354.94
7.65	1.1441	-0.1320	0.9334	0.3611	0.6969	0.7800	-0.0687	0.7830	354.97
7.70	1.1436	-0.1308	0.9336	0.3582	0.6990	0.7795	-0.0683	0.7825	355.00
7.75	1.1431	-0.1297	0.9338	0.3552	0.7010	0.7791	-0.0678	0.7820	355.02
7.80	1.1427	-0.1286	0.9340	0.3524	0.7030	0.7786	-0.0674	0.7815	355.05
7.85	1.1422	-0.1275	0.9342	0.3495	0.7050	0.7781	-0.0670	0.7810	355.08
7.90	1.1418	-0.1264	0.9344	0.3467	0.7070	0.7776	-0.0666	0.7805	355.11
7.95	1.1413	-0.1253	0.9346	0.3440	0.7089	0.7772	-0.0662	0.7800	355.13
8.00	1.1409	-0.1243	0.9348	0.3413	0.7109	0.7767	-0.0658	0.7795	355.16
8.05	1.1404	-0.1233	0.9351	0.3386	0.7127	0.7763	-0.0654	0.7790	355.19
8.10	1.1400	-0.1223	0.9353	0.3360	0.7146	0.7759	-0.0650	0.7786	355.21
8.15	1.1396	-0.1213	0.9355	0.3334	0.7165	0.7754	-0.0646	0.7781	355.24
8.20	1.1391	-0.1203	0.9356	0.3309	0.7183	0.7750	-0.0642	0.7776	355.26
8.25	1.1387	-0.1193	0.9358	0.3284	0.7201	0.7746	-0.0639	0.7772	355.29
8.30	1.1383	-0.1184	0.9360	0.3259	0.7219	0.7742	-0.0635	0.7768	355.31
8.35	1.1379	-0.1175	0.9362	0.3235	0.7236	0.7737	-0.0631	0.7763	355.34
8.40	1.1374	-0.1165	0.9364	0.3211	0.7254	0.7733	-0.0627	0.7759	355.36
8.45	1.1370	-0.1156	0.9366	0.3187	0.7271	0.7729	-0.0624	0.7755	355.39
8.50	1.1366	-0.1148	0.9368	0.3164	0.7288	0.7725	-0.0620	0.7750	355.41
8.55	1.1362	-0.1139	0.9370	0.3141	0.7305	0.7722	-0.0617	0.7746	355.43
8.60	1.1358	-0.1130	0.9371	0.3118	0.7321	0.7718	-0.0613	0.7742	355.46
8.65	1.1354	-0.1122	0.9373	0.3096	0.7338	0.7714	-0.0610	0.7738	355.48
8.70	1.1350	-0.1113	0.9375	0.3074	0.7354	0.7710	-0.0606	0.7734	355.50
8.75	1.1347	-0.1105	0.9377	0.3052	0.7370	0.7706	-0.0603	0.7730	355.53
8.80	1.1343	-0.1097	0.9379	0.3030	0.7386	0.7703	-0.0600	0.7726	355.55
8.85	1.1339	-0.1089	0.9380	0.3009	0.7401	0.7699	-0.0596	0.7722	355.57
8.90	1.1335	-0.1081	0.9382	0.2989	0.7417	0.7695	-0.0593	0.7718	355.59
8.95	1.1331	-0.1073	0.9384	0.2968	0.7432	0.7692	-0.0590	0.7715	355.62
9.00	1.1328	-0.1065	0.9385	0.2948	0.7447	0.7688	-0.0587	0.7711	355.64
9.05	1.1324	-0.1058	0.9387	0.2928	0.7462	0.7685	-0.0583	0.7707	355.66
9.10	1.1320	-0.1050	0.9389	0.2908	0.7477	0.7682	-0.0580	0.7703	355.68
9.15	1.1317	-0.1043	0.9390	0.2888	0.7491	0.7678	-0.0577	0.7700	355.70
9.20	1.1313	-0.1035	0.9392	0.2869	0.7506	0.7675	-0.0574	0.7696	355.72
9.25	1.1310	-0.1028	0.9394	0.2850	0.7520	0.7672	-0.0571	0.7693	355.74
9.30	1.1306	-0.1021	0.9395	0.2831	0.7534	0.7668	-0.0568	0.7689	355.76
9.35	1.1303	-0.1014	0.9397	0.2813	0.7548	0.7665	-0.0565	0.7686	355.78
9.40	1.1299	-0.1007	0.9398	0.2795	0.7562	0.7662	-0.0562	0.7682	355.80
9.45	1.1296	-0.1000	0.9400	0.2777	0.7576	0.7659	-0.0559	0.7679	355.82
9.50	1.1292	-0.0994	0.9401	0.2759	0.7589	0.7656	-0.0556	0.7676	355.84
9.55	1.1289	-0.0987	0.9403	0.2741	0.7602	0.7653	-0.0554	0.7673	355.86
9.60	1.1286	-0.0980	0.9404	0.2724	0.7616	0.7649	-0.0551	0.7669	355.88
9.65	1.1282	-0.0974	0.9406	0.2707	0.7629	0.7646	-0.0548	0.7666	355.90
9.70	1.1279	-0.0967	0.9407	0.2690	0.7642	0.7643	-0.0545	0.7663	355.92
9.75	1.1276	-0.0961	0.9409	0.2673	0.7654	0.7641	-0.0542	0.7660	355.94
9.80	1.1273	-0.0955	0.9410	0.2656	0.7667	0.7638	-0.0540	0.7657	355.96
9.85	1.1269	-0.0949	0.9412	0.2640	0.7680	0.7635	-0.0537	0.7654	355.98
9.90	1.1266	-0.0943	0.9413	0.2624	0.7692	0.7632	-0.0534	0.7651	356.00
9.95	1.1263	-0.0937	0.9415	0.2608	0.7704	0.7629	-0.0532	0.7648	356.01
10.00	1.1260	-0.0931	0.9416	0.2592	0.7716	0.7626	-0.0529	0.7645	356.03

$k = 0.4$ $\sigma = 0.50$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.2129	0.0748	0.2257	19.36	0.8540	0.1577	0.8685	10.46
7.05	0.2135	0.0743	0.2260	19.19	0.8551	0.1565	0.8693	10.37
7.10	0.2141	0.0738	0.2264	19.02	0.8562	0.1553	0.8701	10.28
7.15	0.2147	0.0733	0.2268	18.86	0.8572	0.1542	0.8710	10.19
7.20	0.2152	0.0728	0.2272	18.69	0.8582	0.1530	0.8718	10.11
7.25	0.2158	0.0723	0.2276	18.53	0.8593	0.1519	0.8726	10.02
7.30	0.2163	0.0719	0.2280	18.38	0.8603	0.1507	0.8734	9.94
7.35	0.2169	0.0714	0.2283	18.22	0.8613	0.1496	0.8742	9.86
7.40	0.2174	0.0709	0.2287	18.07	0.8622	0.1485	0.8749	9.77
7.45	0.2179	0.0705	0.2290	17.92	0.8632	0.1475	0.8757	9.69
7.50	0.2185	0.0700	0.2294	17.77	0.8642	0.1464	0.8765	9.62
7.55	0.2190	0.0696	0.2298	17.63	0.8651	0.1454	0.8772	9.54
7.60	0.2195	0.0691	0.2301	17.48	0.8660	0.1443	0.8780	9.46
7.65	0.2200	0.0687	0.2304	17.34	0.8669	0.1433	0.8787	9.39
7.70	0.2205	0.0683	0.2308	17.21	0.8678	0.1423	0.8794	9.31
7.75	0.2209	0.0678	0.2311	17.07	0.8687	0.1413	0.8801	9.24
7.80	0.2214	0.0674	0.2315	16.93	0.8696	0.1403	0.8808	9.17
7.85	0.2219	0.0670	0.2318	16.80	0.8704	0.1394	0.8815	9.10
7.90	0.2224	0.0666	0.2321	16.67	0.8713	0.1384	0.8822	9.03
7.95	0.2228	0.0662	0.2324	16.54	0.8721	0.1375	0.8829	8.96
8.00	0.2233	0.0658	0.2328	16.42	0.8729	0.1366	0.8836	8.89
8.05	0.2237	0.0654	0.2331	16.29	0.8738	0.1357	0.8842	8.83
8.10	0.2241	0.0650	0.2334	16.17	0.8746	0.1348	0.8849	8.76
8.15	0.2246	0.0646	0.2337	16.05	0.8754	0.1339	0.8855	8.70
8.20	0.2250	0.0642	0.2340	15.93	0.8761	0.1330	0.8862	8.63
8.25	0.2254	0.0639	0.2343	15.81	0.8769	0.1321	0.8868	8.57
8.30	0.2258	0.0635	0.2346	15.70	0.8777	0.1313	0.8874	8.51
8.35	0.2263	0.0631	0.2349	15.58	0.8784	0.1304	0.8881	8.45
8.40	0.2267	0.0627	0.2352	15.47	0.8792	0.1296	0.8887	8.39
8.45	0.2271	0.0624	0.2355	15.36	0.8799	0.1288	0.8893	8.33
8.50	0.2275	0.0620	0.2358	15.25	0.8806	0.1280	0.8899	8.27
8.55	0.2278	0.0617	0.2360	15.15	0.8814	0.1272	0.8905	8.21
8.60	0.2282	0.0613	0.2363	15.04	0.8821	0.1264	0.8911	8.15
8.65	0.2286	0.0610	0.2366	14.93	0.8828	0.1256	0.8917	8.10
8.70	0.2290	0.0606	0.2369	14.83	0.8835	0.1248	0.8922	8.04
8.75	0.2294	0.0603	0.2372	14.73	0.8841	0.1241	0.8928	7.99
8.80	0.2297	0.0600	0.2374	14.63	0.8848	0.1233	0.8934	7.93
8.85	0.2301	0.0596	0.2377	14.53	0.8855	0.1226	0.8939	7.88
8.90	0.2305	0.0593	0.2380	14.43	0.8862	0.1218	0.8945	7.83
8.95	0.2308	0.0590	0.2382	14.33	0.8868	0.1211	0.8950	7.78
9.00	0.2312	0.0587	0.2385	14.24	0.8874	0.1204	0.8956	7.72
9.05	0.2315	0.0583	0.2387	14.15	0.8881	0.1197	0.8961	7.67
9.10	0.2318	0.0580	0.2390	14.05	0.8887	0.1190	0.8966	7.62
9.15	0.2322	0.0577	0.2392	13.96	0.8893	0.1183	0.8972	7.57
9.20	0.2325	0.0574	0.2395	13.87	0.8900	0.1176	0.8977	7.53
9.25	0.2328	0.0571	0.2397	13.78	0.8906	0.1169	0.8982	7.48
9.30	0.2332	0.0568	0.2400	13.69	0.8912	0.1162	0.8987	7.43
9.35	0.2335	0.0565	0.2402	13.61	0.8918	0.1156	0.8992	7.38
9.40	0.2338	0.0562	0.2405	13.52	0.8923	0.1149	0.8997	7.34
9.45	0.2341	0.0559	0.2407	13.43	0.8929	0.1143	0.9002	7.29
9.50	0.2344	0.0556	0.2410	13.35	0.8935	0.1136	0.9007	7.25
9.55	0.2347	0.0554	0.2412	13.27	0.8941	0.1130	0.9012	7.20
9.60	0.2351	0.0551	0.2414	13.19	0.8946	0.1124	0.9017	7.16
9.65	0.2354	0.0548	0.2416	13.10	0.8952	0.1117	0.9021	7.12
9.70	0.2357	0.0545	0.2419	13.02	0.8957	0.1111	0.9026	7.07
9.75	0.2359	0.0542	0.2421	12.95	0.8963	0.1105	0.9031	7.03
9.80	0.2362	0.0540	0.2423	12.87	0.8968	0.1099	0.9035	6.99
9.85	0.2365	0.0537	0.2425	12.79	0.8974	0.1093	0.9040	6.95
9.90	0.2368	0.0534	0.2428	12.71	0.8979	0.1087	0.9045	6.91
9.95	0.2371	0.0532	0.2430	12.64	0.8984	0.1082	0.9049	6.86
10.00	0.2374	0.0529	0.2432	12.56	0.8989	0.1076	0.9054	6.82

$k = -1.0$				$\sigma = 0.50$					
a	$\frac{1-\sigma^2}{2} \cdot x$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	1.0061	-5.9752	0.5320	5.3136	0.0049	1.0047	-0.0019	1.0047	359.89
1.05	1.0074	-5.4151	0.5540	5.2221	0.0054	1.0056	-0.0025	1.0056	359.86
1.10	1.0089	-4.9293	0.5754	5.1275	0.0059	1.0066	-0.0032	1.0066	359.82
1.15	1.0105	-4.5051	0.5961	5.0300	0.0065	1.0076	-0.0041	1.0077	359.77
1.20	1.0123	-4.1326	0.6162	4.9298	0.0072	1.0088	-0.0052	1.0088	359.70
1.25	1.0143	-3.8037	0.6356	4.8272	0.0080	1.0099	-0.0065	1.0100	359.63
1.30	1.0165	-3.5118	0.6542	4.7224	0.0089	1.0111	-0.0081	1.0111	359.54
1.35	1.0190	-3.2516	0.6722	4.6155	0.0099	1.0123	-0.0099	1.0123	359.44
1.40	1.0216	-3.0186	0.6894	4.5069	0.0110	1.0134	-0.0119	1.0135	359.33
1.45	1.0243	-2.8093	0.7058	4.3968	0.0123	1.0145	-0.0142	1.0146	359.20
1.50	1.0273	-2.6205	0.7215	4.2856	0.0138	1.0155	-0.0168	1.0156	359.05
1.55	1.0304	-2.4497	0.7364	4.1735	0.0154	1.0163	-0.0197	1.0165	358.89
1.60	1.0337	-2.2947	0.7505	4.0609	0.0172	1.0169	-0.0228	1.0171	358.72
1.65	1.0371	-2.1538	0.7639	3.9482	0.0193	1.0172	-0.0261	1.0176	358.53
1.70	1.0405	-2.0252	0.7765	3.8357	0.0216	1.0173	-0.0296	1.0177	358.33
1.75	1.0441	-1.9076	0.7883	3.7239	0.0241	1.0171	-0.0333	1.0176	358.13
1.80	1.0476	-1.8000	0.7993	3.6130	0.0270	1.0165	-0.0371	1.0172	357.91
1.85	1.0512	-1.7011	0.8097	3.5034	0.0301	1.0156	-0.0409	1.0164	357.69
1.90	1.0547	-1.6103	0.8193	3.3955	0.0335	1.0143	-0.0448	1.0153	357.47
1.95	1.0582	-1.5266	0.8282	3.2896	0.0373	1.0127	-0.0486	1.0139	357.25
2.00	1.0616	-1.4493	0.8365	3.1860	0.0413	1.0108	-0.0523	1.0121	357.04
2.05	1.0650	-1.3779	0.8442	3.0849	0.0457	1.0085	-0.0559	1.0100	356.83
2.10	1.0682	-1.3119	0.8513	2.9866	0.0505	1.0059	-0.0593	1.0077	356.63
2.15	1.0712	-1.2506	0.8578	2.8911	0.0555	1.0031	-0.0625	1.0051	356.43
2.20	1.0742	-1.1938	0.8639	2.7987	0.0609	1.0001	-0.0655	1.0022	356.25
2.25	1.0769	-1.1409	0.8694	2.7093	0.0666	0.9968	-0.0682	0.9992	356.09
2.30	1.0796	-1.0917	0.8746	2.6232	0.0726	0.9935	-0.0707	0.9960	355.93
2.35	1.0820	-1.0458	0.8793	2.5402	0.0788	0.9900	-0.0729	0.9926	355.79
2.40	1.0843	-1.0030	0.8837	2.4605	0.0854	0.9864	-0.0748	0.9892	355.66
2.45	1.0864	-0.9630	0.8877	2.3839	0.0922	0.9828	-0.0765	0.9858	355.55
2.50	1.0883	-0.9255	0.8914	2.3104	0.0992	0.9792	-0.0779	0.9823	355.45
2.55	1.0901	-0.8905	0.8948	2.2400	0.1065	0.9756	-0.0791	0.9788	355.36
2.60	1.0917	-0.8575	0.8980	2.1726	0.1139	0.9720	-0.0801	0.9753	355.29
2.65	1.0932	-0.8266	0.9010	2.1081	0.1215	0.9685	-0.0808	0.9719	355.23
2.70	1.0946	-0.7975	0.9037	2.0463	0.1292	0.9650	-0.0814	0.9685	355.18
2.75	1.0957	-0.7702	0.9063	1.9873	0.1371	0.9617	-0.0818	0.9651	355.14
2.80	1.0968	-0.7444	0.9087	1.9308	0.1450	0.9584	-0.0820	0.9619	355.11
2.85	1.0977	-0.7201	0.9109	1.8769	0.1531	0.9552	-0.0820	0.9587	355.09
2.90	1.0985	-0.6971	0.9130	1.8253	0.1612	0.9522	-0.0820	0.9557	355.08
2.95	1.0992	-0.6754	0.9149	1.7761	0.1693	0.9492	-0.0818	0.9527	355.07
3.00	1.0998	-0.6548	0.9167	1.7290	0.1775	0.9463	-0.0816	0.9498	355.07
3.05	1.1002	-0.6354	0.9185	1.6840	0.1856	0.9436	-0.0812	0.9471	355.08
3.10	1.1006	-0.6170	0.9201	1.6409	0.1938	0.9409	-0.0808	0.9444	355.09
3.15	1.1009	-0.5995	0.9217	1.5998	0.2019	0.9384	-0.0803	0.9418	355.11
3.20	1.1011	-0.5829	0.9231	1.5605	0.2100	0.9360	-0.0797	0.9393	355.13
3.25	1.1012	-0.5671	0.9245	1.5229	0.2181	0.9336	-0.0792	0.9370	355.15
3.30	1.1012	-0.5521	0.9259	1.4869	0.2261	0.9314	-0.0785	0.9347	355.18
3.35	1.1011	-0.5378	0.9272	1.4524	0.2340	0.9292	-0.0779	0.9325	355.21
3.40	1.1010	-0.5242	0.9284	1.4195	0.2418	0.9272	-0.0772	0.9304	355.24
3.45	1.1008	-0.5112	0.9296	1.3879	0.2496	0.9252	-0.0765	0.9284	355.27
3.50	1.1005	-0.4989	0.9307	1.3576	0.2573	0.9233	-0.0758	0.9264	355.31
3.55	1.1002	-0.4871	0.9318	1.3286	0.2648	0.9215	-0.0750	0.9246	355.35
3.60	1.0998	-0.4758	0.9329	1.3008	0.2723	0.9198	-0.0743	0.9228	355.38
3.65	1.0993	-0.4650	0.9339	1.2741	0.2797	0.9181	-0.0736	0.9211	355.42
3.70	1.0989	-0.4547	0.9349	1.2485	0.2869	0.9165	-0.0728	0.9194	355.46
3.75	1.0983	-0.4448	0.9359	1.2239	0.2941	0.9150	-0.0721	0.9178	355.50
3.80	1.0977	-0.4353	0.9369	1.2003	0.3011	0.9135	-0.0714	0.9163	355.53
3.85	1.0971	-0.4262	0.9378	1.1776	0.3080	0.9121	-0.0706	0.9148	355.57
3.90	1.0964	-0.4175	0.9387	1.1558	0.3148	0.9107	-0.0699	0.9134	355.61
3.95	1.0957	-0.4091	0.9396	1.1348	0.3215	0.9094	-0.0692	0.9121	355.65

$k = -1.0$ $\sigma = 0.50$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0047	0.0019	0.0051	158.57	0.0158	0.1239	0.1249	82.72
1.05	-0.0056	0.0025	0.0061	156.39	0.0193	0.1363	0.1377	81.94
1.10	-0.0066	0.0032	0.0073	154.11	0.0233	0.1492	0.1510	81.13
1.15	-0.0076	0.0041	0.0087	151.73	0.0279	0.1626	0.1650	80.26
1.20	-0.0088	0.0052	0.0102	149.25	0.0332	0.1764	0.1795	79.35
1.25	-0.0099	0.0065	0.0119	146.68	0.0392	0.1906	0.1946	78.39
1.30	-0.0111	0.0081	0.0137	144.02	0.0459	0.2051	0.2102	77.38
1.35	-0.0123	0.0099	0.0158	141.28	0.0535	0.2199	0.2263	76.32
1.40	-0.0134	0.0119	0.0180	138.46	0.0620	0.2348	0.2429	75.21
1.45	-0.0145	0.0142	0.0203	135.57	0.0714	0.2499	0.2599	74.05
1.50	-0.0155	0.0168	0.0229	132.61	0.0818	0.2649	0.2772	72.84
1.55	-0.0163	0.0197	0.0255	129.59	0.0932	0.2798	0.2949	71.59
1.60	-0.0169	0.0228	0.0283	126.53	0.1055	0.2945	0.3128	70.28
1.65	-0.0172	0.0261	0.0313	123.43	0.1189	0.3088	0.3309	68.94
1.70	-0.0173	0.0296	0.0343	120.30	0.1332	0.3226	0.3490	67.56
1.75	-0.0171	0.0333	0.0374	117.16	0.1485	0.3358	0.3672	66.14
1.80	-0.0165	0.0371	0.0406	114.01	0.1646	0.3483	0.3853	64.70
1.85	-0.0156	0.0409	0.0438	110.87	0.1816	0.3600	0.4032	63.23
1.90	-0.0143	0.0448	0.0470	107.76	0.1991	0.3707	0.4208	61.75
1.95	-0.0127	0.0486	0.0502	104.67	0.2173	0.3804	0.4381	60.26
2.00	-0.0108	0.0523	0.0534	101.63	0.2359	0.3891	0.4550	58.77
2.05	-0.0085	0.0559	0.0565	98.64	0.2549	0.3966	0.4715	57.28
2.10	-0.0059	0.0593	0.0596	95.71	0.2740	0.4031	0.4874	55.79
2.15	-0.0031	0.0625	0.0626	92.84	0.2932	0.4084	0.5028	54.33
2.20	-0.0001	0.0655	0.0655	90.05	0.3123	0.4127	0.5175	52.88
2.25	0.0032	0.0682	0.0683	87.34	0.3313	0.4158	0.5317	51.46
2.30	0.0065	0.0707	0.0710	84.71	0.3500	0.4180	0.5452	50.06
2.35	0.0100	0.0729	0.0736	82.16	0.3684	0.4193	0.5581	48.70
2.40	0.0136	0.0748	0.0760	79.70	0.3863	0.4196	0.5704	47.37
2.45	0.0172	0.0765	0.0784	77.33	0.4038	0.4192	0.5820	46.07
2.50	0.0208	0.0779	0.0807	75.05	0.4207	0.4180	0.5931	44.82
2.55	0.0244	0.0791	0.0828	72.85	0.4371	0.4162	0.6035	43.60
2.60	0.0280	0.0801	0.0848	70.73	0.4528	0.4138	0.6134	42.42
2.65	0.0315	0.0808	0.0867	68.70	0.4680	0.4109	0.6228	41.28
2.70	0.0350	0.0814	0.0886	66.75	0.4825	0.4075	0.6316	40.18
2.75	0.0383	0.0818	0.0903	64.89	0.4965	0.4038	0.6399	39.12
2.80	0.0416	0.0820	0.0919	63.09	0.5098	0.3997	0.6478	38.10
2.85	0.0448	0.0820	0.0935	61.38	0.5225	0.3954	0.6552	37.12
2.90	0.0478	0.0820	0.0949	59.73	0.5346	0.3909	0.6622	36.17
2.95	0.0508	0.0818	0.0963	58.16	0.5461	0.3862	0.6689	35.26
3.00	0.0537	0.0816	0.0976	56.65	0.5571	0.3813	0.6751	34.39
3.05	0.0564	0.0812	0.0989	55.21	0.5676	0.3764	0.6811	33.55
3.10	0.0591	0.0808	0.1001	53.82	0.5776	0.3714	0.6867	32.75
3.15	0.0616	0.0803	0.1012	52.50	0.5871	0.3664	0.6920	31.97
3.20	0.0640	0.0797	0.1023	51.23	0.5961	0.3614	0.6971	31.23
3.25	0.0664	0.0792	0.1033	50.02	0.6047	0.3564	0.7019	30.51
3.30	0.0686	0.0785	0.1043	48.85	0.6129	0.3514	0.7065	29.83
3.35	0.0708	0.0779	0.1052	47.74	0.6207	0.3465	0.7109	29.17
3.40	0.0728	0.0772	0.1061	46.67	0.6281	0.3416	0.7150	28.54
3.45	0.0748	0.0765	0.1070	45.64	0.6352	0.3368	0.7190	27.93
3.50	0.0767	0.0758	0.1078	44.66	0.6420	0.3320	0.7228	27.35
3.55	0.0785	0.0750	0.1086	43.72	0.6485	0.3274	0.7264	26.79
3.60	0.0802	0.0743	0.1093	42.81	0.6547	0.3228	0.7299	26.25
3.65	0.0819	0.0736	0.1101	41.94	0.6606	0.3183	0.7333	25.73
3.70	0.0835	0.0728	0.1108	41.10	0.6662	0.3139	0.7365	25.23
3.75	0.0850	0.0721	0.1115	40.30	0.6717	0.3097	0.7396	24.75
3.80	0.0865	0.0714	0.1121	39.53	0.6769	0.3055	0.7426	24.29
3.85	0.0879	0.0706	0.1128	38.79	0.6819	0.3014	0.7455	23.85
3.90	0.0893	0.0699	0.1134	38.07	0.6867	0.2974	0.7483	23.42
3.95	0.0906	0.0692	0.1140	37.39	0.6913	0.2935	0.7510	23.01

$k = -1.0 \qquad \sigma = 0.50$

a	$\frac{1-\sigma^2}{2}\cdot X$ REAL	$\frac{1-\sigma^2}{2}\cdot X$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
4.00	1.0950	-0.4011	0.9405	1.1146	0.3281	0.9082	-0.0685	0.9108	355.69
4.05	1.0942	-0.3934	0.9414	1.0951	0.3345	0.9069	-0.0678	0.9095	355.72
4.10	1.0934	-0.3859	0.9422	1.0763	0.3408	0.9058	-0.0671	0.9083	355.76
4.15	1.0925	-0.3788	0.9431	1.0582	0.3471	0.9046	-0.0665	0.9071	355.80
4.20	1.0916	-0.3719	0.9439	1.0408	0.3532	0.9035	-0.0658	0.9059	355.83
4.25	1.0908	-0.3652	0.9447	1.0239	0.3592	0.9025	-0.0652	0.9048	355.87
4.30	1.0898	-0.3588	0.9455	1.0076	0.3651	0.9014	-0.0645	0.9037	355.91
4.35	1.0889	-0.3526	0.9463	0.9919	0.3709	0.9004	-0.0639	0.9027	355.94
4.40	1.0879	-0.3466	0.9471	0.9767	0.3765	0.8995	-0.0633	0.9017	355.97
4.45	1.0870	-0.3408	0.9479	0.9620	0.3821	0.8985	-0.0627	0.9007	356.01
4.50	1.0860	-0.3352	0.9486	0.9477	0.3876	0.8976	-0.0621	0.8997	356.04
4.55	1.0850	-0.3298	0.9494	0.9339	0.3930	0.8967	-0.0615	0.8988	356.07
4.60	1.0840	-0.3246	0.9501	0.9206	0.3983	0.8958	-0.0610	0.8979	356.11
4.65	1.0829	-0.3195	0.9509	0.9076	0.4035	0.8950	-0.0604	0.8970	356.14
4.70	1.0819	-0.3146	0.9516	0.8950	0.4086	0.8942	-0.0599	0.8962	356.17
4.75	1.0809	-0.3098	0.9523	0.8828	0.4136	0.8934	-0.0594	0.8953	356.20
4.80	1.0798	-0.3052	0.9530	0.8710	0.4186	0.8926	-0.0588	0.8945	356.23
4.85	1.0787	-0.3007	0.9538	0.8594	0.4234	0.8918	-0.0583	0.8937	356.26
4.90	1.0777	-0.2964	0.9545	0.8482	0.4282	0.8911	-0.0578	0.8930	356.29
4.95	1.0766	-0.2921	0.9552	0.8373	0.4329	0.8903	-0.0573	0.8922	356.32
5.00	1.0755	-0.2880	0.9559	0.8267	0.4375	0.8896	-0.0568	0.8914	356.34
5.05	1.0745	-0.2840	0.9565	0.8164	0.4420	0.8889	-0.0564	0.8907	356.37
5.10	1.0734	-0.2801	0.9572	0.8063	0.4465	0.8883	-0.0559	0.8900	356.40
5.15	1.0723	-0.2763	0.9579	0.7965	0.4509	0.8876	-0.0554	0.8893	356.43
5.20	1.0713	-0.2726	0.9586	0.7869	0.4552	0.8869	-0.0550	0.8886	356.45
5.25	1.0702	-0.2690	0.9592	0.7776	0.4595	0.8863	-0.0545	0.8880	356.48
5.30	1.0691	-0.2655	0.9599	0.7685	0.4637	0.8857	-0.0541	0.8873	356.50
5.35	1.0681	-0.2621	0.9605	0.7596	0.4678	0.8851	-0.0537	0.8867	356.53
5.40	1.0670	-0.2588	0.9611	0.7510	0.4719	0.8844	-0.0533	0.8861	356.55
5.45	1.0660	-0.2555	0.9618	0.7425	0.4759	0.8839	-0.0528	0.8854	356.58
5.50	1.0649	-0.2523	0.9624	0.7342	0.4799	0.8833	-0.0524	0.8848	356.60
5.55	1.0639	-0.2492	0.9630	0.7261	0.4838	0.8827	-0.0520	0.8842	356.63
5.60	1.0628	-0.2462	0.9636	0.7182	0.4876	0.8822	-0.0516	0.8837	356.65
5.65	1.0618	-0.2432	0.9642	0.7104	0.4914	0.8816	-0.0512	0.8831	356.67
5.70	1.0608	-0.2403	0.9648	0.7028	0.4952	0.8811	-0.0509	0.8825	356.70
5.75	1.0598	-0.2375	0.9654	0.6954	0.4989	0.8805	-0.0505	0.8820	356.72
5.80	1.0588	-0.2347	0.9660	0.6882	0.5025	0.8800	-0.0501	0.8814	356.74
5.85	1.0578	-0.2320	0.9666	0.6810	0.5061	0.8795	-0.0497	0.8809	356.76
5.90	1.0568	-0.2294	0.9671	0.6741	0.5096	0.8790	-0.0494	0.8804	356.78
5.95	1.0558	-0.2268	0.9677	0.6672	0.5131	0.8785	-0.0490	0.8799	356.81
6.00	1.0548	-0.2243	0.9683	0.6605	0.5166	0.8780	-0.0487	0.8794	356.83
6.05	1.0539	-0.2218	0.9688	0.6540	0.5200	0.8776	-0.0483	0.8789	356.85
6.10	1.0529	-0.2194	0.9694	0.6475	0.5233	0.8771	-0.0480	0.8784	356.87
6.15	1.0520	-0.2170	0.9699	0.6412	0.5267	0.8766	-0.0476	0.8779	356.89
6.20	1.0510	-0.2146	0.9704	0.6350	0.5299	0.8762	-0.0473	0.8775	356.91
6.25	1.0501	-0.2124	0.9710	0.6289	0.5332	0.8757	-0.0470	0.8770	356.93
6.30	1.0492	-0.2101	0.9715	0.6230	0.5363	0.8753	-0.0467	0.8765	356.95
6.35	1.0483	-0.2079	0.9720	0.6171	0.5395	0.8749	-0.0463	0.8761	356.97
6.40	1.0474	-0.2058	0.9725	0.6114	0.5426	0.8744	-0.0460	0.8757	356.99
6.45	1.0465	-0.2037	0.9730	0.6057	0.5457	0.8740	-0.0457	0.8752	357.01
6.50	1.0456	-0.2016	0.9735	0.6002	0.5487	0.8736	-0.0454	0.8748	357.03
6.55	1.0447	-0.1996	0.9740	0.5947	0.5517	0.8732	-0.0451	0.8744	357.04
6.60	1.0439	-0.1976	0.9745	0.5894	0.5547	0.8728	-0.0448	0.8740	357.06
6.65	1.0430	-0.1956	0.9749	0.5841	0.5576	0.8724	-0.0445	0.8736	357.08
6.70	1.0422	-0.1937	0.9754	0.5790	0.5605	0.8720	-0.0442	0.8732	357.10
6.75	1.0413	-0.1918	0.9759	0.5739	0.5633	0.8717	-0.0439	0.8728	357.12
6.80	1.0405	-0.1900	0.9763	0.5689	0.5662	0.8713	-0.0436	0.8724	357.13
6.85	1.0397	-0.1882	0.9768	0.5640	0.5689	0.8709	-0.0433	0.8720	357.15
6.90	1.0389	-0.1864	0.9772	0.5592	0.5717	0.8706	-0.0431	0.8716	357.17
6.95	1.0381	-0.1846	0.9777	0.5544	0.5744	0.8702	-0.0428	0.8713	357.19

	$k = -1.0$			$\sigma = 0.50$				
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.0918	0.0685	0.1146	36.72	0.6958	0.2897	0.7537	22.61
4.05	0.0931	0.0678	0.1151	36.08	0.7001	0.2860	0.7562	22.22
4.10	0.0942	0.0671	0.1157	35.47	0.7042	0.2824	0.7587	21.85
4.15	0.0954	0.0665	0.1162	34.88	0.7082	0.2789	0.7612	21.50
4.20	0.0965	0.0658	0.1168	34.30	0.7121	0.2755	0.7635	21.15
4.25	0.0975	0.0652	0.1173	33.75	0.7158	0.2722	0.7658	20.82
4.30	0.0986	0.0645	0.1178	33.21	0.7195	0.2689	0.7681	20.50
4.35	0.0996	0.0639	0.1183	32.70	0.7230	0.2658	0.7703	20.18
4.40	0.1005	0.0633	0.1188	32.20	0.7264	0.2627	0.7724	19.88
4.45	0.1015	0.0627	0.1193	31.71	0.7297	0.2597	0.7745	19.59
4.50	0.1024	0.0621	0.1198	31.24	0.7329	0.2568	0.7766	19.31
4.55	0.1033	0.0615	0.1202	30.79	0.7361	0.2539	0.7786	19.03
4.60	0.1042	0.0610	0.1207	30.35	0.7391	0.2511	0.7806	18.77
4.65	0.1050	0.0604	0.1212	29.92	0.7421	0.2484	0.7826	18.51
4.70	0.1058	0.0599	0.1216	29.50	0.7450	0.2458	0.7845	18.26
4.75	0.1066	0.0594	0.1220	29.10	0.7478	0.2432	0.7864	18.01
4.80	0.1074	0.0588	0.1225	28.71	0.7506	0.2406	0.7882	17.78
4.85	0.1082	0.0583	0.1229	28.33	0.7533	0.2382	0.7900	17.55
4.90	0.1089	0.0578	0.1233	27.96	0.7559	0.2358	0.7918	17.32
4.95	0.1097	0.0573	0.1237	27.60	0.7585	0.2334	0.7936	17.10
5.00	0.1104	0.0568	0.1241	27.25	0.7610	0.2311	0.7953	16.89
5.05	0.1111	0.0564	0.1245	26.91	0.7635	0.2288	0.7970	16.68
5.10	0.1117	0.0559	0.1249	26.58	0.7659	0.2266	0.7987	16.48
5.15	0.1124	0.0554	0.1253	26.25	0.7683	0.2244	0.8004	16.29
5.20	0.1131	0.0550	0.1257	25.94	0.7706	0.2223	0.8020	16.09
5.25	0.1137	0.0545	0.1261	25.63	0.7729	0.2202	0.8036	15.91
5.30	0.1143	0.0541	0.1265	25.33	0.7751	0.2182	0.8052	15.72
5.35	0.1149	0.0537	0.1269	25.03	0.7773	0.2162	0.8068	15.54
5.40	0.1156	0.0533	0.1272	24.75	0.7794	0.2142	0.8083	15.37
5.45	0.1161	0.0528	0.1276	24.47	0.7815	0.2123	0.8098	15.20
5.50	0.1167	0.0524	0.1280	24.19	0.7836	0.2104	0.8113	15.03
5.55	0.1173	0.0520	0.1283	23.92	0.7856	0.2086	0.8128	14.87
5.60	0.1178	0.0516	0.1287	23.66	0.7876	0.2068	0.8143	14.71
5.65	0.1184	0.0512	0.1290	23.41	0.7895	0.2050	0.8157	14.55
5.70	0.1189	0.0509	0.1294	23.16	0.7914	0.2032	0.8171	14.40
5.75	0.1195	0.0505	0.1297	22.91	0.7933	0.2015	0.8185	14.25
5.80	0.1200	0.0501	0.1300	22.67	0.7952	0.1998	0.8199	14.11
5.85	0.1205	0.0497	0.1304	22.43	0.7970	0.1981	0.8212	13.96
5.90	0.1210	0.0494	0.1307	22.20	0.7988	0.1965	0.8226	13.82
5.95	0.1215	0.0490	0.1310	21.98	0.8005	0.1949	0.8239	13.68
6.00	0.1220	0.0487	0.1313	21.75	0.8022	0.1933	0.8252	13.55
6.05	0.1224	0.0483	0.1316	21.54	0.8039	0.1917	0.8265	13.41
6.10	0.1229	0.0480	0.1319	21.32	0.8056	0.1902	0.8277	13.28
6.15	0.1234	0.0476	0.1323	21.12	0.8072	0.1887	0.8290	13.16
6.20	0.1238	0.0473	0.1326	20.91	0.8088	0.1872	0.8302	13.03
6.25	0.1243	0.0470	0.1329	20.71	0.8104	0.1857	0.8314	12.91
6.30	0.1247	0.0467	0.1331	20.51	0.8120	0.1843	0.8326	12.79
6.35	0.1251	0.0463	0.1334	20.32	0.8135	0.1829	0.8338	12.67
6.40	0.1256	0.0460	0.1337	20.13	0.8150	0.1815	0.8350	12.55
6.45	0.1260	0.0457	0.1340	19.94	0.8165	0.1801	0.8361	12.44
6.50	0.1264	0.0454	0.1343	19.76	0.8180	0.1787	0.8373	12.33
6.55	0.1268	0.0451	0.1346	19.58	0.8194	0.1774	0.8384	12.22
6.60	0.1272	0.0448	0.1348	19.40	0.8208	0.1761	0.8395	12.11
6.65	0.1276	0.0445	0.1351	19.23	0.8222	0.1748	0.8406	12.00
6.70	0.1280	0.0442	0.1354	19.05	0.8236	0.1735	0.8417	11.90
6.75	0.1283	0.0439	0.1356	18.89	0.8249	0.1722	0.8427	11.79
6.80	0.1287	0.0436	0.1359	18.72	0.8263	0.1710	0.8438	11.69
6.85	0.1291	0.0433	0.1362	18.56	0.8276	0.1698	0.8448	11.59
6.90	0.1294	0.0431	0.1364	18.40	0.8289	0.1685	0.8458	11.49
6.95	0.1298	0.0428	0.1367	18.24	0.8301	0.1673	0.8468	11.40

$k = -1.0 \qquad \sigma = 0.50$

a	$\frac{1-\sigma^2}{2}\cdot x$ REAL	$\frac{1-\sigma^2}{2}\cdot x$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
7.00	1.0373	-0.1829	0.9781	0.5497	0.5771	0.8699	-0.0425	0.8709	357.20
7.05	1.0365	-0.1812	0.9785	0.5452	0.5797	0.8695	-0.0422	0.8705	357.22
7.10	1.0357	-0.1796	0.9790	0.5406	0.5824	0.8692	-0.0420	0.8702	357.24
7.15	1.0350	-0.1779	0.9794	0.5362	0.5850	0.8688	-0.0417	0.8698	357.25
7.20	1.0342	-0.1763	0.9798	0.5318	0.5875	0.8685	-0.0414	0.8695	357.27
7.25	1.0334	-0.1748	0.9802	0.5275	0.5901	0.8682	-0.0412	0.8692	357.28
7.30	1.0327	-0.1732	0.9806	0.5233	0.5926	0.8679	-0.0409	0.8688	357.30
7.35	1.0320	-0.1717	0.9810	0.5191	0.5950	0.8675	-0.0407	0.8685	357.31
7.40	1.0312	-0.1702	0.9814	0.5150	0.5975	0.8672	-0.0404	0.8682	357.33
7.45	1.0305	-0.1687	0.9818	0.5110	0.5999	0.8669	-0.0402	0.8679	357.35
7.50	1.0298	-0.1673	0.9822	0.5070	0.6023	0.8666	-0.0400	0.8675	357.36
7.55	1.0291	-0.1659	0.9826	0.5031	0.6047	0.8663	-0.0397	0.8672	357.38
7.60	1.0284	-0.1645	0.9830	0.4992	0.6070	0.8660	-0.0395	0.8669	357.39
7.65	1.0277	-0.1631	0.9833	0.4954	0.6093	0.8657	-0.0392	0.8666	357.40
7.70	1.0271	-0.1617	0.9837	0.4917	0.6116	0.8654	-0.0390	0.8663	357.42
7.75	1.0264	-0.1604	0.9841	0.4880	0.6139	0.8652	-0.0388	0.8660	357.43
7.80	1.0257	-0.1591	0.9844	0.4844	0.6161	0.8649	-0.0386	0.8657	357.45
7.85	1.0251	-0.1578	0.9848	0.4808	0.6183	0.8646	-0.0383	0.8655	357.46
7.90	1.0244	-0.1565	0.9852	0.4773	0.6205	0.8643	-0.0381	0.8652	357.48
7.95	1.0238	-0.1553	0.9855	0.4738	0.6226	0.8641	-0.0379	0.8649	357.49
8.00	1.0231	-0.1540	0.9859	0.4704	0.6248	0.8638	-0.0377	0.8646	357.50
8.05	1.0225	-0.1528	0.9862	0.4670	0.6269	0.8635	-0.0375	0.8644	357.52
8.10	1.0219	-0.1516	0.9865	0.4636	0.6290	0.8633	-0.0372	0.8641	357.53
8.15	1.0212	-0.1505	0.9869	0.4604	0.6311	0.8630	-0.0370	0.8638	357.54
8.20	1.0206	-0.1493	0.9872	0.4571	0.6331	0.8628	-0.0368	0.8636	357.56
8.25	1.0200	-0.1482	0.9875	0.4539	0.6351	0.8625	-0.0366	0.8633	357.57
8.30	1.0194	-0.1470	0.9879	0.4508	0.6371	0.8623	-0.0364	0.8631	357.58
8.35	1.0188	-0.1459	0.9882	0.4477	0.6391	0.8620	-0.0362	0.8628	357.59
8.40	1.0183	-0.1448	0.9885	0.4446	0.6411	0.8618	-0.0360	0.8626	357.61
8.45	1.0177	-0.1438	0.9888	0.4416	0.6430	0.8616	-0.0358	0.8623	357.62
8.50	1.0171	-0.1427	0.9891	0.4386	0.6449	0.8613	-0.0356	0.8621	357.63
8.55	1.0165	-0.1416	0.9894	0.4357	0.6468	0.8611	-0.0354	0.8618	357.64
8.60	1.0160	-0.1406	0.9898	0.4328	0.6487	0.8609	-0.0353	0.8616	357.66
8.65	1.0154	-0.1396	0.9901	0.4299	0.6506	0.8607	-0.0351	0.8614	357.67
8.70	1.0149	-0.1386	0.9904	0.4271	0.6524	0.8604	-0.0349	0.8611	357.68
8.75	1.0143	-0.1376	0.9907	0.4243	0.6542	0.8602	-0.0347	0.8609	357.69
8.80	1.0138	-0.1366	0.9909	0.4215	0.6561	0.8600	-0.0345	0.8607	357.70
8.85	1.0132	-0.1357	0.9912	0.4188	0.6578	0.8598	-0.0343	0.8605	357.71
8.90	1.0127	-0.1347	0.9915	0.4161	0.6596	0.8596	-0.0342	0.8602	357.72
8.95	1.0122	-0.1338	0.9918	0.4135	0.6614	0.8594	-0.0340	0.8600	357.74
9.00	1.0117	-0.1329	0.9921	0.4108	0.6631	0.8591	-0.0338	0.8598	357.75
9.05	1.0111	-0.1320	0.9924	0.4082	0.6648	0.8589	-0.0336	0.8596	357.76
9.10	1.0106	-0.1311	0.9927	0.4057	0.6665	0.8587	-0.0335	0.8594	357.77
9.15	1.0101	-0.1302	0.9929	0.4032	0.6682	0.8585	-0.0333	0.8592	357.78
9.20	1.0096	-0.1293	0.9932	0.4007	0.6699	0.8583	-0.0331	0.8590	357.79
9.25	1.0091	-0.1284	0.9935	0.3982	0.6715	0.8581	-0.0330	0.8588	357.80
9.30	1.0086	-0.1276	0.9937	0.3958	0.6731	0.8580	-0.0328	0.8586	357.81
9.35	1.0082	-0.1267	0.9940	0.3934	0.6748	0.8578	-0.0326	0.8584	357.82
9.40	1.0077	-0.1259	0.9943	0.3910	0.6764	0.8576	-0.0325	0.8582	357.83
9.45	1.0072	-0.1251	0.9945	0.3887	0.6780	0.8574	-0.0323	0.8580	357.84
9.50	1.0067	-0.1243	0.9948	0.3864	0.6795	0.8572	-0.0321	0.8578	357.85
9.55	1.0063	-0.1235	0.9950	0.3841	0.6811	0.8570	-0.0320	0.8576	357.86
9.60	1.0058	-0.1227	0.9953	0.3818	0.6826	0.8568	-0.0318	0.8574	357.87
9.65	1.0053	-0.1219	0.9955	0.3796	0.6842	0.8567	-0.0317	0.8572	357.88
9.70	1.0049	-0.1211	0.9958	0.3774	0.6857	0.8565	-0.0315	0.8571	357.89
9.75	1.0044	-0.1204	0.9960	0.3752	0.6872	0.8563	-0.0314	0.8569	357.90
9.80	1.0040	-0.1196	0.9963	0.3730	0.6887	0.8561	-0.0312	0.8567	357.91
9.85	1.0035	-0.1189	0.9965	0.3709	0.6901	0.8560	-0.0311	0.8565	357.92
9.90	1.0031	-0.1182	0.9967	0.3688	0.6916	0.8558	-0.0309	0.8563	357.93
9.95	1.0027	-0.1174	0.9970	0.3667	0.6930	0.8556	-0.0308	0.8562	357.94
10.00	1.0022	-0.1167	0.9972	0.3646	0.6945	0.8555	-0.0306	0.8560	357.95

$k = -1.0$ $\sigma = 0.50$

a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.1301	0.0425	0.1369	18.09	0.8314	0.1662	0.8478	11.30
7.05	0.1305	0.0422	0.1372	17.94	0.8326	0.1650	0.8488	11.21
7.10	0.1308	0.0420	0.1374	17.79	0.8338	0.1639	0.8498	11.12
7.15	0.1312	0.0417	0.1376	17.64	0.8350	0.1627	0.8507	11.03
7.20	0.1315	0.0414	0.1379	17.49	0.8362	0.1616	0.8517	10.94
7.25	0.1318	0.0412	0.1381	17.35	0.8374	0.1605	0.8526	10.85
7.30	0.1321	0.0409	0.1383	17.21	0.8385	0.1594	0.8535	10.76
7.35	0.1325	0.0407	0.1386	17.07	0.8397	0.1583	0.8545	10.68
7.40	0.1328	0.0404	0.1388	16.94	0.8408	0.1573	0.8554	10.60
7.45	0.1331	0.0402	0.1390	16.81	0.8419	0.1562	0.8562	10.51
7.50	0.1334	0.0400	0.1392	16.67	0.8429	0.1552	0.8571	10.43
7.55	0.1337	0.0397	0.1395	16.54	0.8440	0.1542	0.8580	10.35
7.60	0.1340	0.0395	0.1397	16.42	0.8451	0.1532	0.8588	10.27
7.65	0.1343	0.0392	0.1399	16.29	0.8461	0.1522	0.8597	10.20
7.70	0.1346	0.0390	0.1401	16.17	0.8471	0.1512	0.8605	10.12
7.75	0.1348	0.0388	0.1403	16.04	0.8481	0.1503	0.8613	10.05
7.80	0.1351	0.0386	0.1405	15.92	0.8491	0.1493	0.8622	9.97
7.85	0.1354	0.0383	0.1407	15.81	0.8501	0.1484	0.8630	9.90
7.90	0.1357	0.0381	0.1409	15.69	0.8511	0.1474	0.8638	9.83
7.95	0.1359	0.0379	0.1411	15.57	0.8521	0.1465	0.8646	9.76
8.00	0.1362	0.0377	0.1413	15.46	0.8530	0.1456	0.8653	9.69
8.05	0.1365	0.0375	0.1415	15.35	0.8539	0.1447	0.8661	9.62
8.10	0.1367	0.0372	0.1417	15.24	0.8549	0.1438	0.8669	9.55
8.15	0.1370	0.0370	0.1419	15.13	0.8558	0.1429	0.8676	9.48
8.20	0.1372	0.0368	0.1421	15.02	0.8567	0.1421	0.8684	9.42
8.25	0.1375	0.0366	0.1423	14.92	0.8576	0.1412	0.8691	9.35
8.30	0.1377	0.0364	0.1425	14.81	0.8584	0.1404	0.8698	9.29
8.35	0.1380	0.0362	0.1426	14.71	0.8593	0.1395	0.8705	9.22
8.40	0.1382	0.0360	0.1428	14.61	0.8601	0.1387	0.8713	9.16
8.45	0.1384	0.0358	0.1430	14.51	0.8610	0.1379	0.8720	9.10
8.50	0.1387	0.0356	0.1432	14.41	0.8618	0.1371	0.8727	9.04
8.55	0.1389	0.0354	0.1433	14.31	0.8626	0.1363	0.8733	8.98
8.60	0.1391	0.0353	0.1435	14.22	0.8635	0.1355	0.8740	8.92
8.65	0.1393	0.0351	0.1437	14.12	0.8643	0.1347	0.8747	8.86
8.70	0.1396	0.0349	0.1439	14.03	0.8651	0.1340	0.8754	8.80
8.75	0.1398	0.0347	0.1440	13.94	0.8658	0.1332	0.8760	8.75
8.80	0.1400	0.0345	0.1442	13.85	0.8666	0.1324	0.8767	8.69
8.85	0.1402	0.0343	0.1444	13.76	0.8674	0.1317	0.8773	8.63
8.90	0.1404	0.0342	0.1445	13.67	0.8681	0.1310	0.8780	8.58
8.95	0.1406	0.0340	0.1447	13.58	0.8689	0.1302	0.8786	8.52
9.00	0.1409	0.0338	0.1449	13.49	0.8696	0.1295	0.8792	8.47
9.05	0.1411	0.0336	0.1450	13.41	0.8704	0.1288	0.8799	8.42
9.10	0.1413	0.0335	0.1452	13.32	0.8711	0.1281	0.8805	8.37
9.15	0.1415	0.0333	0.1453	13.24	0.8718	0.1274	0.8811	8.31
9.20	0.1417	0.0331	0.1455	13.16	0.8725	0.1267	0.8817	8.26
9.25	0.1419	0.0330	0.1456	13.08	0.8732	0.1260	0.8823	8.21
9.30	0.1420	0.0328	0.1458	13.00	0.8739	0.1254	0.8829	8.16
9.35	0.1422	0.0326	0.1459	12.92	0.8746	0.1247	0.8834	8.11
9.40	0.1424	0.0325	0.1461	12.84	0.8753	0.1240	0.8840	8.07
9.45	0.1426	0.0323	0.1462	12.76	0.8759	0.1234	0.8846	8.02
9.50	0.1428	0.0321	0.1464	12.68	0.8766	0.1227	0.8852	7.97
9.55	0.1430	0.0320	0.1465	12.61	0.8773	0.1221	0.8857	7.92
9.60	0.1432	0.0318	0.1467	12.53	0.8779	0.1215	0.8863	7.88
9.65	0.1433	0.0317	0.1468	12.46	0.8786	0.1208	0.8868	7.83
9.70	0.1435	0.0315	0.1469	12.39	0.8792	0.1202	0.8874	7.79
9.75	0.1437	0.0314	0.1471	12.32	0.8798	0.1196	0.8879	7.74
9.80	0.1439	0.0312	0.1472	12.24	0.8804	0.1190	0.8884	7.70
9.85	0.1440	0.0311	0.1474	12.17	0.8811	0.1184	0.8890	7.65
9.90	0.1442	0.0309	0.1475	12.10	0.8817	0.1178	0.8895	7.61
9.95	0.1444	0.0308	0.1476	12.04	0.8823	0.1172	0.8900	7.57
10.00	0.1445	0.0306	0.1478	11.97	0.8829	0.1166	0.8905	7.52

a	$\frac{1-\sigma^2}{2}\cdot x$ REAL	$\frac{1-\sigma^2}{2}\cdot x$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
	$k=-2.0$			$\sigma = 0.50$					
1.00	1.0083	-5.9763	0.5319	5.3119	0.0049	1.0045	-0.0022	1.0045	359.88
1.05	1.0100	-5.4166	0.5539	5.2199	0.0054	1.0052	-0.0029	1.0053	359.84
1.10	1.0118	-4.9312	0.5752	5.1249	0.0059	1.0061	-0.0037	1.0061	359.79
1.15	1.0138	-4.5077	0.5958	5.0270	0.0066	1.0069	-0.0047	1.0070	359.73
1.20	1.0160	-4.1358	0.6158	4.9265	0.0073	1.0078	-0.0059	1.0078	359.67
1.25	1.0184	-3.8076	0.6350	4.8235	0.0080	1.0087	-0.0073	1.0087	359.59
1.30	1.0209	-3.5165	0.6535	4.7185	0.0089	1.0095	-0.0089	1.0096	359.50
1.35	1.0236	-3.2572	0.6713	4.6116	0.0099	1.0103	-0.0107	1.0103	359.40
1.40	1.0264	-3.0253	0.6883	4.5032	0.0111	1.0109	-0.0127	1.0110	359.28
1.45	1.0293	-2.8171	0.7046	4.3937	0.0124	1.0115	-0.0149	1.0116	359.16
1.50	1.0322	-2.6295	0.7201	4.2834	0.0138	1.0118	-0.0172	1.0120	359.02
1.55	1.0352	-2.4599	0.7348	4.1727	0.0154	1.0120	-0.0198	1.0122	358.88
1.60	1.0382	-2.3062	0.7488	4.0619	0.0172	1.0119	-0.0224	1.0122	358.73
1.65	1.0412	-2.1665	0.7619	3.9514	0.0192	1.0116	-0.0252	1.0119	358.57
1.70	1.0442	-2.0392	0.7744	3.8417	0.0215	1.0111	-0.0280	1.0115	358.41
1.75	1.0470	-1.9229	0.7861	3.7330	0.0239	1.0103	-0.0309	1.0107	358.25
1.80	1.0498	-1.8164	0.7971	3.6257	0.0266	1.0092	-0.0337	1.0097	358.09
1.85	1.0525	-1.7187	0.8074	3.5201	0.0296	1.0079	-0.0365	1.0085	357.92
1.90	1.0550	-1.6289	0.8171	3.4164	0.0328	1.0063	-0.0392	1.0071	357.77
1.95	1.0574	-1.5461	0.8261	3.3149	0.0363	1.0045	-0.0418	1.0054	357.61
2.00	1.0597	-1.4697	0.8345	3.2158	0.0401	1.0025	-0.0443	1.0035	357.47
2.05	1.0618	-1.3991	0.8424	3.1192	0.0442	1.0004	-0.0466	1.0015	357.33
2.10	1.0638	-1.3336	0.8498	3.0254	0.0485	0.9981	-0.0488	0.9993	357.20
2.15	1.0656	-1.2729	0.8566	2.9343	0.0532	0.9956	-0.0507	0.9969	357.08
2.20	1.0673	-1.2165	0.8630	2.8460	0.0581	0.9931	-0.0525	0.9945	356.97
2.25	1.0688	-1.1640	0.8689	2.7607	0.0632	0.9905	-0.0541	0.9920	356.87
2.30	1.0702	-1.1150	0.8744	2.6783	0.0687	0.9879	-0.0555	0.9894	356.78
2.35	1.0715	-1.0693	0.8796	2.5988	0.0744	0.9852	-0.0567	0.9868	356.70
2.40	1.0726	-1.0265	0.8844	2.5222	0.0803	0.9825	-0.0578	0.9842	356.63
2.45	1.0736	-0.9865	0.8888	2.4484	0.0864	0.9798	-0.0586	0.9816	356.57
2.50	1.0744	-0.9490	0.8930	2.3775	0.0928	0.9771	-0.0593	0.9789	356.52
2.55	1.0752	-0.9138	0.8969	2.3094	0.0993	0.9745	-0.0599	0.9764	356.48
2.60	1.0758	-0.8808	0.9005	2.2439	0.1060	0.9719	-0.0603	0.9738	356.45
2.65	1.0764	-0.8497	0.9039	2.1811	0.1129	0.9694	-0.0606	0.9713	356.42
2.70	1.0768	-0.8204	0.9071	2.1208	0.1199	0.9670	-0.0608	0.9689	356.40
2.75	1.0771	-0.7928	0.9101	2.0629	0.1271	0.9646	-0.0608	0.9665	356.39
2.80	1.0774	-0.7667	0.9129	2.0075	0.1343	0.9623	-0.0608	0.9642	356.38
2.85	1.0776	-0.7421	0.9156	1.9543	0.1417	0.9601	-0.0607	0.9620	356.38
2.90	1.0776	-0.7189	0.9180	1.9034	0.1491	0.9579	-0.0605	0.9598	356.39
2.95	1.0776	-0.6969	0.9204	1.8545	0.1565	0.9558	-0.0602	0.9577	356.39
3.00	1.0776	-0.6760	0.9226	1.8077	0.1640	0.9538	-0.0599	0.9557	356.40
3.05	1.0774	-0.6563	0.9247	1.7629	0.1715	0.9519	-0.0596	0.9538	356.42
3.10	1.0772	-0.6375	0.9267	1.7199	0.1791	0.9501	-0.0592	0.9519	356.44
3.15	1.0770	-0.6197	0.9286	1.6787	0.1866	0.9483	-0.0587	0.9501	356.46
3.20	1.0766	-0.6028	0.9304	1.6392	0.1941	0.9466	-0.0583	0.9484	356.48
3.25	1.0762	-0.5867	0.9321	1.6014	0.2016	0.9450	-0.0578	0.9468	356.50
3.30	1.0758	-0.5714	0.9337	1.5651	0.2091	0.9435	-0.0572	0.9452	356.53
3.35	1.0753	-0.5568	0.9353	1.5303	0.2165	0.9420	-0.0567	0.9437	356.55
3.40	1.0747	-0.5429	0.9368	1.4969	0.2238	0.9405	-0.0562	0.9422	356.58
3.45	1.0742	-0.5297	0.9383	1.4649	0.2311	0.9392	-0.0556	0.9408	356.61
3.50	1.0735	-0.5170	0.9397	1.4342	0.2383	0.9379	-0.0551	0.9395	356.64
3.55	1.0728	-0.5049	0.9410	1.4047	0.2454	0.9366	-0.0545	0.9382	356.67
3.60	1.0721	-0.4934	0.9423	1.3763	0.2525	0.9354	-0.0539	0.9370	356.70
3.65	1.0713	-0.4823	0.9436	1.3491	0.2595	0.9342	-0.0534	0.9358	356.73
3.70	1.0705	-0.4717	0.9448	1.3229	0.2664	0.9331	-0.0528	0.9346	356.76
3.75	1.0697	-0.4616	0.9460	1.2978	0.2731	0.9321	-0.0523	0.9335	356.79
3.80	1.0688	-0.4519	0.9472	1.2736	0.2798	0.9310	-0.0517	0.9325	356.82
3.85	1.0679	-0.4425	0.9483	1.2503	0.2864	0.9300	-0.0512	0.9314	356.85
3.90	1.0670	-0.4336	0.9494	1.2279	0.2929	0.9291	-0.0507	0.9305	356.88
3.95	1.0660	-0.4250	0.9505	1.2063	0.2993	0.9282	-0.0501	0.9295	356.91

a	$1+\eta$				$1+\eta F_{10}$			
$k = -2.0$ $\sigma = 0.50$	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0045	0.0022	0.0050	154.03	0.0161	0.1242	0.1252	82.60
1.05	-0.0052	0.0029	0.0060	151.44	0.0197	0.1367	0.1381	81.80
1.10	-0.0061	0.0037	0.0071	148.74	0.0239	0.1496	0.1515	80.94
1.15	-0.0069	0.0047	0.0084	145.95	0.0287	0.1631	0.1656	80.03
1.20	-0.0078	0.0059	0.0098	143.08	0.0342	0.1769	0.1802	79.06
1.25	-0.0087	0.0073	0.0113	140.11	0.0405	0.1911	0.1953	78.04
1.30	-0.0095	0.0089	0.0130	137.08	0.0476	0.2056	0.2110	76.97
1.35	-0.0103	0.0107	0.0148	133.99	0.0556	0.2202	0.2271	75.84
1.40	-0.0109	0.0127	0.0167	130.84	0.0645	0.2350	0.2437	74.65
1.45	-0.0115	0.0149	0.0188	127.65	0.0744	0.2497	0.2606	73.42
1.50	-0.0118	0.0172	0.0209	124.44	0.0852	0.2644	0.2778	72.14
1.55	-0.0120	0.0198	0.0231	121.21	0.0970	0.2788	0.2952	70.81
1.60	-0.0119	0.0224	0.0254	117.97	0.1098	0.2928	0.3128	69.44
1.65	-0.0116	0.0252	0.0277	114.75	0.1235	0.3064	0.3304	68.04
1.70	-0.0111	0.0280	0.0301	111.54	0.1381	0.3194	0.3480	66.61
1.75	-0.0103	0.0309	0.0325	108.37	0.1536	0.3317	0.3655	65.16
1.80	-0.0092	0.0337	0.0350	105.24	0.1697	0.3432	0.3829	63.69
1.85	-0.0079	0.0365	0.0374	102.16	0.1865	0.3539	0.4000	62.21
1.90	-0.0063	0.0392	0.0397	99.13	0.2038	0.3636	0.4168	60.73
1.95	-0.0045	0.0418	0.0421	96.18	0.2215	0.3723	0.4332	59.25
2.00	-0.0025	0.0443	0.0444	93.29	0.2395	0.3801	0.4492	57.78
2.05	-0.0004	0.0466	0.0466	90.48	0.2578	0.3868	0.4648	56.32
2.10	0.0019	0.0488	0.0488	87.75	0.2761	0.3925	0.4798	54.88
2.15	0.0044	0.0507	0.0509	85.10	0.2944	0.3972	0.4944	53.46
2.20	0.0069	0.0525	0.0530	82.54	0.3125	0.4009	0.5083	52.06
2.25	0.0095	0.0541	0.0549	80.06	0.3305	0.4037	0.5217	50.69
2.30	0.0121	0.0555	0.0568	77.66	0.3482	0.4056	0.5346	49.36
2.35	0.0148	0.0567	0.0586	75.36	0.3655	0.4067	0.5468	48.05
2.40	0.0175	0.0578	0.0604	73.13	0.3825	0.4071	0.5586	46.78
2.45	0.0202	0.0586	0.0620	70.99	0.3990	0.4067	0.5697	45.55
2.50	0.0229	0.0593	0.0636	68.93	0.4150	0.4057	0.5803	44.35
2.55	0.0255	0.0599	0.0651	66.96	0.4305	0.4041	0.5904	43.19
2.60	0.0281	0.0603	0.0665	65.06	0.4454	0.4020	0.6000	42.07
2.65	0.0306	0.0606	0.0679	63.24	0.4599	0.3995	0.6091	40.98
2.70	0.0330	0.0608	0.0692	61.49	0.4737	0.3965	0.6178	39.93
2.75	0.0354	0.0608	0.0704	59.81	0.4870	0.3932	0.6260	38.92
2.80	0.0377	0.0608	0.0715	58.20	0.4998	0.3897	0.6337	37.94
2.85	0.0399	0.0607	0.0727	56.66	0.5120	0.3858	0.6411	37.00
2.90	0.0421	0.0605	0.0737	55.18	0.5237	0.3818	0.6481	36.09
2.95	0.0442	0.0602	0.0747	53.76	0.5349	0.3776	0.6548	35.22
3.00	0.0462	0.0599	0.0756	52.40	0.5456	0.3733	0.6611	34.38
3.05	0.0481	0.0596	0.0765	51.10	0.5558	0.3688	0.6670	33.57
3.10	0.0499	0.0592	0.0774	49.85	0.5655	0.3643	0.6727	32.79
3.15	0.0517	0.0587	0.0782	48.65	0.5748	0.3598	0.6781	32.04
3.20	0.0534	0.0583	0.0790	47.51	0.5837	0.3552	0.6833	31.32
3.25	0.0550	0.0578	0.0797	46.41	0.5922	0.3506	0.6882	30.63
3.30	0.0565	0.0572	0.0805	45.35	0.6003	0.3461	0.6929	29.96
3.35	0.0580	0.0567	0.0811	44.34	0.6080	0.3415	0.6974	29.32
3.40	0.0595	0.0562	0.0818	43.37	0.6154	0.3370	0.7017	28.71
3.45	0.0608	0.0556	0.0824	42.44	0.6225	0.3326	0.7058	28.11
3.50	0.0621	0.0551	0.0830	41.54	0.6292	0.3282	0.7097	27.54
3.55	0.0634	0.0545	0.0836	40.69	0.6357	0.3239	0.7135	27.00
3.60	0.0646	0.0539	0.0842	39.86	0.6419	0.3196	0.7171	26.47
3.65	0.0658	0.0534	0.0847	39.07	0.6478	0.3154	0.7206	25.96
3.70	0.0669	0.0528	0.0852	38.31	0.6535	0.3113	0.7239	25.47
3.75	0.0679	0.0523	0.0857	37.57	0.6590	0.3073	0.7272	25.00
3.80	0.0690	0.0517	0.0862	36.87	0.6643	0.3034	0.7303	24.55
3.85	0.0700	0.0512	0.0867	36.19	0.6693	0.2996	0.7333	24.11
3.90	0.0709	0.0507	0.0872	35.54	0.6742	0.2958	0.7362	23.69
3.95	0.0718	0.0501	0.0876	34.91	0.6789	0.2921	0.7391	23.28

$k = -2.0 \qquad \sigma = 0.50$

α	$\frac{1-\sigma^2}{2}\cdot X$ REAL	$\frac{1-\sigma^2}{2}\cdot X$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
4.00	1.0651	-0.4167	0.9516	1.1855	0.3056	0.9273	-0.0496	0.9286	356.94
4.05	1.0640	-0.4088	0.9526	1.1654	0.3118	0.9264	-0.0491	0.9277	356.97
4.10	1.0630	-0.4011	0.9536	1.1461	0.3179	0.9256	-0.0486	0.9269	356.99
4.15	1.0620	-0.3938	0.9546	1.1274	0.3239	0.9248	-0.0481	0.9260	357.02
4.20	1.0609	-0.3867	0.9556	1.1094	0.3298	0.9240	-0.0476	0.9252	357.05
4.25	1.0598	-0.3798	0.9566	1.0920	0.3356	0.9233	-0.0472	0.9245	357.08
4.30	1.0587	-0.3732	0.9576	1.0751	0.3413	0.9225	-0.0467	0.9237	357.10
4.35	1.0576	-0.3669	0.9585	1.0588	0.3469	0.9218	-0.0462	0.9230	357.13
4.40	1.0564	-0.3607	0.9594	1.0431	0.3524	0.9212	-0.0458	0.9223	357.15
4.45	1.0553	-0.3548	0.9603	1.0278	0.3578	0.9205	-0.0454	0.9216	357.18
4.50	1.0541	-0.3490	0.9612	1.0131	0.3631	0.9198	-0.0449	0.9209	357.20
4.55	1.0530	-0.3434	0.9621	0.9987	0.3683	0.9192	-0.0445	0.9203	357.23
4.60	1.0518	-0.3380	0.9630	0.9849	0.3735	0.9186	-0.0441	0.9197	357.25
4.65	1.0506	-0.3328	0.9639	0.9714	0.3786	0.9180	-0.0437	0.9190	357.28
4.70	1.0494	-0.3277	0.9648	0.9583	0.3835	0.9174	-0.0433	0.9184	357.30
4.75	1.0482	-0.3228	0.9656	0.9456	0.3884	0.9168	-0.0429	0.9179	357.32
4.80	1.0470	-0.3181	0.9664	0.9333	0.3933	0.9163	-0.0425	0.9173	357.34
4.85	1.0458	-0.3134	0.9673	0.9213	0.3980	0.9158	-0.0422	0.9167	357.36
4.90	1.0446	-0.3089	0.9681	0.9096	0.4027	0.9152	-0.0418	0.9162	357.39
4.95	1.0434	-0.3046	0.9689	0.8982	0.4073	0.9147	-0.0414	0.9156	357.41
5.00	1.0422	-0.3003	0.9697	0.8872	0.4118	0.9142	-0.0411	0.9151	357.43
5.05	1.0410	-0.2962	0.9705	0.8764	0.4163	0.9137	-0.0407	0.9146	357.45
5.10	1.0398	-0.2922	0.9713	0.8659	0.4207	0.9132	-0.0404	0.9141	357.47
5.15	1.0386	-0.2882	0.9721	0.8557	0.4250	0.9127	-0.0401	0.9136	357.49
5.20	1.0375	-0.2844	0.9728	0.8457	0.4293	0.9123	-0.0397	0.9131	357.51
5.25	1.0363	-0.2807	0.9736	0.8359	0.4335	0.9118	-0.0394	0.9127	357.52
5.30	1.0351	-0.2771	0.9744	0.8264	0.4376	0.9114	-0.0391	0.9122	357.54
5.35	1.0339	-0.2736	0.9751	0.8171	0.4417	0.9109	-0.0388	0.9118	357.56
5.40	1.0328	-0.2701	0.9758	0.8081	0.4457	0.9105	-0.0385	0.9113	357.58
5.45	1.0316	-0.2667	0.9766	0.7992	0.4497	0.9101	-0.0382	0.9109	357.60
5.50	1.0304	-0.2635	0.9773	0.7905	0.4536	0.9097	-0.0379	0.9105	357.61
5.55	1.0293	-0.2603	0.9780	0.7820	0.4575	0.9093	-0.0376	0.9101	357.63
5.60	1.0282	-0.2571	0.9787	0.7737	0.4613	0.9089	-0.0373	0.9096	357.65
5.65	1.0270	-0.2541	0.9794	0.7656	0.4650	0.9085	-0.0370	0.9092	357.67
5.70	1.0259	-0.2511	0.9801	0.7577	0.4688	0.9081	-0.0368	0.9088	357.68
5.75	1.0248	-0.2481	0.9808	0.7499	0.4724	0.9077	-0.0365	0.9085	357.70
5.80	1.0237	-0.2453	0.9814	0.7422	0.4760	0.9074	-0.0362	0.9081	357.71
5.85	1.0226	-0.2425	0.9821	0.7348	0.4796	0.9070	-0.0359	0.9077	357.73
5.90	1.0215	-0.2398	0.9828	0.7274	0.4831	0.9066	-0.0357	0.9073	357.75
5.95	1.0205	-0.2371	0.9834	0.7203	0.4866	0.9063	-0.0354	0.9070	357.76
6.00	1.0194	-0.2345	0.9840	0.7132	0.4901	0.9059	-0.0352	0.9066	357.78
6.05	1.0183	-0.2319	0.9847	0.7063	0.4935	0.9056	-0.0349	0.9063	357.79
6.10	1.0173	-0.2294	0.9853	0.6995	0.4968	0.9053	-0.0347	0.9059	357.81
6.15	1.0163	-0.2269	0.9859	0.6929	0.5001	0.9049	-0.0344	0.9056	357.82
6.20	1.0153	-0.2245	0.9865	0.6864	0.5034	0.9046	-0.0342	0.9052	357.84
6.25	1.0142	-0.2221	0.9871	0.6800	0.5066	0.9043	-0.0339	0.9049	357.85
6.30	1.0132	-0.2198	0.9877	0.6737	0.5098	0.9040	-0.0337	0.9046	357.86
6.35	1.0123	-0.2175	0.9883	0.6675	0.5130	0.9037	-0.0335	0.9043	357.88
6.40	1.0113	-0.2153	0.9889	0.6615	0.5161	0.9034	-0.0333	0.9040	357.89
6.45	1.0103	-0.2131	0.9895	0.6555	0.5192	0.9031	-0.0330	0.9037	357.91
6.50	1.0094	-0.2110	0.9900	0.6496	0.5222	0.9028	-0.0328	0.9034	357.92
6.55	1.0084	-0.2089	0.9906	0.6439	0.5252	0.9025	-0.0326	0.9031	357.93
6.60	1.0075	-0.2068	0.9911	0.6382	0.5282	0.9022	-0.0324	0.9028	357.95
6.65	1.0066	-0.2048	0.9917	0.6327	0.5312	0.9019	-0.0322	0.9025	357.96
6.70	1.0056	-0.2028	0.9922	0.6272	0.5341	0.9016	-0.0319	0.9022	357.97
6.75	1.0047	-0.2009	0.9927	0.6219	0.5369	0.9014	-0.0317	0.9019	357.98
6.80	1.0038	-0.1989	0.9933	0.6166	0.5398	0.9011	-0.0315	0.9017	358.00
6.85	1.0030	-0.1971	0.9938	0.6114	0.5426	0.9008	-0.0313	0.9014	358.01
6.90	1.0021	-0.1952	0.9943	0.6063	0.5454	0.9006	-0.0311	0.9011	358.02
6.95	1.0012	-0.1934	0.9948	0.6013	0.5481	0.9003	-0.0309	0.9009	358.03

$k = -2.0$ $\sigma = 0.50$

a	$1+\eta$ REAL	$1+\eta$ IMAG.	$1+\eta$ MODULUS	$1+\eta$ PHASE (DEGREES)	$1+\eta F_{10}$ REAL	$1+\eta F_{10}$ IMAG.	$1+\eta F_{10}$ MODULUS	$1+\eta F_{10}$ PHASE (DEGREES)
4.00	0.0727	0.0496	0.0880	34.30	0.6834	0.2886	0.7418	22.89
4.05	0.0736	0.0491	0.0885	33.72	0.6878	0.2851	0.7445	22.51
4.10	0.0744	0.0486	0.0889	33.15	0.6920	0.2817	0.7471	22.15
4.15	0.0752	0.0481	0.0893	32.61	0.6961	0.2783	0.7497	21 79
4.20	0.0760	0.0476	0.0897	32.08	0.7000	0.2751	0.7521	21.45
4.25	0.0767	0.0472	0.0901	31.57	0.7039	0.2719	0.7546	21.12
4.30	0.0775	0.0467	0.0904	31.08	0.7076	0.2688	0.7569	20.80
4.35	0.0782	0.0462	0.0908	30.60	0.7112	0.2658	0.7592	20.49
4.40	0.0788	0.0458	0.0912	30.14	0.7147	0.2629	0.7615	20.20
4.45	0.0795	0.0454	0.0915	29.70	0.7181	0.2600	0.7637	19.91
4.50	0.0802	0.0449	0.0919	29.27	0.7214	0.2572	0.7659	19.62
4.55	0.0808	0.0445	0.0922	28.85	0.7246	0.2545	0.7680	19.35
4.60	0.0814	0.0441	0.0926	28.44	0.7277	0.2518	0.7701	19.09
4.65	0.0820	0.0437	0.0929	28.05	0.7308	0.2492	0.7721	18.83
4.70	0.0826	0.0433	0.0932	27.67	0.7338	0.2467	0.7741	18.58
4.75	0.0832	0.0429	0.0936	27.30	0.7367	0.2442	0.7761	18.34
4.80	0.0837	0.0425	0.0939	26.93	0.7395	0.2417	0.7780	18.10
4.85	0.0842	0.0422	0.0942	26.58	0.7423	0.2394	0.7799	17.87
4.90	0.0848	0.0418	0.0945	26.24	0.7450	0.2370	0.7818	17.65
4.95	0.0853	0.0414	0.0948	25.91	0.7476	0.2348	0.7836	17.43
5.00	0.0858	0.0411	0.0951	25.59	0.7502	0.2325	0.7855	17.22
5.05	0.0863	0.0407	0.0954	25.27	0.7528	0.2304	0.7872	17.01
5.10	0.0868	0.0404	0.0957	24.96	0.7553	0.2282	0.7890	16.81
5.15	0.0873	0.0401	0.0960	24.66	0.7577	0.2261	0.7907	16.62
5.20	0.0877	0.0397	0.0963	24.37	0.7601	0.2241	0.7924	16.43
5.25	0.0882	0.0394	0.0966	24.09	0.7624	0.2221	0.7941	16.24
5.30	0.0886	0.0391	0.0969	23.81	0.7647	0.2201	0.7958	16.06
5.35	0.0891	0.0388	0.0971	23.54	0.7670	0.2182	0.7974	15.88
5.40	0.0895	0.0385	0.0974	23.27	0.7692	0.2163	0.7990	15.70
5.45	0.0899	0.0382	0.0977	23.01	0.7714	0.2144	0.8006	15.53
5.50	0.0903	0.0379	0.0979	22.76	0.7735	0.2126	0.8022	15.37
5.55	0.0907	0.0376	0.0982	22.51	0.7756	0.2108	0.8037	15.20
5.60	0.0911	0.0373	0.0985	22.27	0.7776	0.2090	0.8052	15.04
5.65	0.0915	0.0370	0.0987	22.03	0.7797	0.2073	0.8067	14.89
5.70	0.0919	0.0368	0.0990	21.80	0.7816	0.2056	0.8082	14.73
5.75	0.0923	0.0365	0.0992	21.57	0.7836	0.2039	0.8097	14.58
5.80	0.0926	0.0362	0.0995	21.35	0.7855	0.2022	0.8111	14.44
5.85	0.0930	0.0359	0.0997	21.13	0.7874	0.2006	0.8125	14.29
5.90	0.0934	0.0357	0.1000	20.92	0.7892	0.1990	0.8139	14.15
5.95	0.0937	0.0354	0.1002	20.71	0.7910	0.1974	0.8153	14.01
6.00	0.0941	0.0352	0.1004	20.50	0.7928	0.1959	0.8167	13.88
6.05	0.0944	0.0349	0.1007	20.30	0.7946	0.1944	0.8180	13.74
6.10	0.0947	0.0347	0.1009	20.10	0.7963	0.1929	0.8193	13.61
6.15	0.0951	0.0344	0.1011	19.91	0.7980	0.1914	0.8206	13.49
6.20	0.0954	0.0342	0.1013	19.72	0.7997	0.1899	0.8219	13.36
6.25	0.0957	0.0339	0.1016	19.53	0.8013	0.1885	0.8232	13.24
6.30	0.0960	0.0337	0.1018	19.35	0.8030	0.1871	0.8245	13.11
6.35	0.0963	0.0335	0.1020	19.17	0.8045	0.1857	0.8257	13.00
6.40	0.0966	0.0333	0.1022	18.99	0.8061	0.1843	0.8269	12.88
6.45	0.0969	0.0330	0.1024	18.82	0.8077	0.1830	0.8281	12.76
6.50	0.0972	0.0328	0.1026	18.64	0.8092	0.1816	0.8293	12.65
6.55	0.0975	0.0326	0.1028	18.48	0.8107	0.1803	0.8305	12.54
6.60	0.0978	0.0324	0.1030	18.31	0.8121	0.1790	0.8316	12.43
6.65	0.0981	0.0322	0.1032	18.15	0.8136	0.1777	0.8328	12.32
6.70	0.0984	0.0319	0.1034	17.99	0.8150	0.1765	0.8339	12.22
6.75	0.0986	0.0317	0.1036	17.83	0.8164	0.1752	0.8350	12.11
6.80	0.0989	0.0315	0.1038	17.68	0.8178	0.1740	0.8361	12.01
6.85	0.0992	0.0313	0.1040	17.53	0.8192	0.1728	0.8372	11.91
6.90	0.0994	0.0311	0.1042	17.38	0.8205	0.1716	0.8383	11.81
6.95	0.0997	0.0309	0.1044	17.23	0.8218	0.1704	0.8393	11.71

$k = -2.0$ $\sigma = 0.50$									
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	1.0004	-0.1916	0.9953	0.5963	0.5508	0.9001	-0.0307	0.9006	358.04
7.05	0.9995	-0.1899	0.9958	0.5915	0.5535	0.8998	-0.0305	0.9003	358.06
7.10	0.9987	-0.1881	0.9963	0.5867	0.5562	0.8996	-0.0303	0.9001	358.07
7.15	0.9978	-0.1865	0.9968	0.5820	0.5588	0.8993	-0.0301	0.8998	358.08
7.20	0.9970	-0.1848	0.9973	0.5773	0.5614	0.8991	-0.0300	0.8996	358.09
7.25	0.9962	-0.1832	0.9977	0.5728	0.5640	0.8989	-0.0298	0.8994	358.10
7.30	0.9954	-0.1816	0.9982	0.5683	0.5665	0.8986	-0.0296	0.8991	358.11
7.35	0.9946	-0.1800	0.9987	0.5639	0.5690	0.8984	-0.0294	0.8989	358.12
7.40	0.9938	-0.1784	0.9991	0.5595	0.5715	0.8982	-0.0292	0.8987	358.14
7.45	0.9931	-0.1769	0.9996	0.5552	0.5739	0.8980	-0.0291	0.8984	358.15
7.50	0.9923	-0.1754	1.0000	0.5510	0.5764	0.8977	-0.0289	0.8982	358.16
7.55	0.9916	-0.1739	1.0004	0.5468	0.5788	0.8975	-0.0287	0.8980	358.17
7.60	0.9908	-0.1725	1.0009	0.5427	0.5812	0.8973	-0.0285	0.8978	358.18
7.65	0.9901	-0.1710	1.0013	0.5387	0.5835	0.8971	-0.0284	0.8976	358.19
7.70	0.9893	-0.1696	1.0017	0.5347	0.5858	0.8969	-0.0282	0.8973	358.20
7.75	0.9886	-0.1682	1.0021	0.5308	0.5881	0.8967	-0.0280	0.8971	358.21
7.80	0.9879	-0.1669	1.0026	0.5269	0.5904	0.8965	-0.0279	0.8969	358.22
7.85	0.9872	-0.1655	1.0030	0.5231	0.5927	0.8963	-0.0277	0.8967	358.23
7.90	0.9865	-0.1642	1.0034	0.5194	0.5949	0.8961	-0.0276	0.8965	358.24
7.95	0.9858	-0.1629	1.0038	0.5157	0.5971	0.8959	-0.0274	0.8963	358.25
8.00	0.9851	-0.1616	1.0042	0.5120	0.5993	0.8957	-0.0272	0.8961	358.26
8.05	0.9844	-0.1604	1.0046	0.5084	0.6014	0.8955	-0.0271	0.8959	358.27
8.10	0.9838	-0.1591	1.0050	0.5049	0.6036	0.8953	-0.0269	0.8957	358.28
8.15	0.9831	-0.1579	1.0053	0.5014	0.6057	0.8952	-0.0268	0.8956	358.29
8.20	0.9824	-0.1567	1.0057	0.4979	0.6078	0.8950	-0.0266	0.8954	358.30
8.25	0.9818	-0.1555	1.0061	0.4945	0.6099	0.8948	-0.0265	0.8952	358.30
8.30	0.9811	-0.1543	1.0065	0.4912	0.6119	0.8946	-0.0263	0.8950	358.31
8.35	0.9805	-0.1532	1.0068	0.4878	0.6140	0.8944	-0.0262	0.8948	358.32
8.40	0.9799	-0.1520	1.0072	0.4846	0.6160	0.8943	-0.0261	0.8947	358.33
8.45	0.9793	-0.1509	1.0076	0.4813	0.6180	0.8941	-0.0259	0.8945	358.34
8.50	0.9786	-0.1498	1.0079	0.4782	0.6199	0.8939	-0.0258	0.8943	358.35
8.55	0.9780	-0.1487	1.0083	0.4750	0.6219	0.8938	-0.0256	0.8941	358.36
8.60	0.9774	-0.1477	1.0086	0.4719	0.6238	0.8936	-0.0255	0.8940	358.37
8.65	0.9768	-0.1466	1.0090	0.4689	0.6257	0.8934	-0.0254	0.8938	358.37
8.70	0.9762	-0.1456	1.0093	0.4658	0.6276	0.8933	-0.0252	0.8936	358.38
8.75	0.9756	-0.1445	1.0097	0.4628	0.6295	0.8931	-0.0251	0.8935	358.39
8.80	0.9751	-0.1435	1.0100	0.4599	0.6313	0.8930	-0.0250	0.8933	358.40
8.85	0.9745	-0.1425	1.0103	0.4570	0.6332	0.8928	-0.0248	0.8932	358.41
8.90	0.9739	-0.1415	1.0107	0.4541	0.6350	0.8927	-0.0247	0.8930	358.41
8.95	0.9734	-0.1405	1.0110	0.4513	0.6368	0.8925	-0.0246	0.8928	358.42
9.00	0.9728	-0.1396	1.0113	0.4485	0.6386	0.8924	-0.0245	0.8927	358.43
9.05	0.9722	-0.1386	1.0116	0.4457	0.6404	0.8922	-0.0243	0.8925	358.44
9.10	0.9717	-0.1377	1.0119	0.4430	0.6421	0.8921	-0.0242	0.8924	358.45
9.15	0.9712	-0.1368	1.0122	0.4403	0.6439	0.8919	-0.0241	0.8922	358.45
9.20	0.9706	-0.1359	1.0126	0.4376	0.6456	0.8918	-0.0240	0.8921	358.46
9.25	0.9701	-0.1350	1.0129	0.4350	0.6473	0.8916	-0.0238	0.8920	358.47
9.30	0.9696	-0.1341	1.0132	0.4324	0.6490	0.8915	-0.0237	0.8918	358.48
9.35	0.9690	-0.1332	1.0135	0.4298	0.6506	0.8914	-0.0236	0.8917	358.48
9.40	0.9685	-0.1323	1.0138	0.4273	0.6523	0.8912	-0.0235	0.8915	358.49
9.45	0.9680	-0.1315	1.0141	0.4247	0.6539	0.8911	-0.0234	0.8914	358.50
9.50	0.9675	-0.1306	1.0144	0.4223	0.6556	0.8910	-0.0233	0.8913	358.50
9.55	0.9670	-0.1298	1.0146	0.4198	0.6572	0.8908	-0.0231	0.8911	358.51
9.60	0.9665	-0.1290	1.0149	0.4174	0.6588	0.8907	-0.0230	0.8910	358.52
9.65	0.9660	-0.1282	1.0152	0.4150	0.6604	0.8906	-0.0229	0.8909	358.53
9.70	0.9655	-0.1274	1.0155	0.4126	0.6619	0.8904	-0.0228	0.8907	358.53
9.75	0.9650	-0.1266	1.0158	0.4103	0.6635	0.8903	-0.0227	0.8906	358.54
9.80	0.9646	-0.1258	1.0161	0.4079	0.6650	0.8902	-0.0226	0.8905	358.55
9.85	0.9641	-0.1250	1.0163	0.4057	0.6665	0.8901	-0.0225	0.8903	358.55
9.90	0.9636	-0.1242	1.0166	0.4034	0.6681	0.8899	-0.0224	0.8902	358.56
9.95	0.9632	-0.1235	1.0169	0.4011	0.6696	0.8898	-0.0223	0.8901	358.57
10.00	0.9627	-0.1227	1.0171	0.3989	0.6710	0.8897	-0.0222	0.8900	358.57

$k = -2.0$ $\sigma = 0.50$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.0999	0.0307	0.1045	17.09	0.8231	0.1692	0.8404	11.62
7.05	0.1002	0.0305	0.1047	16.95	0.8244	0.1681	0.8414	11.52
7.10	0.1004	0.0303	0.1049	16.81	0.8257	0.1670	0.8424	11.43
7.15	0.1007	0.0301	0.1051	16.67	0.8269	0.1659	0.8434	11.34
7.20	0.1009	0.0300	0.1053	16.54	0.8282	0.1648	0.8444	11.25
7.25	0.1011	0.0298	0.1054	16.41	0.8294	0.1637	0.8454	11.16
7.30	0.1014	0.0296	0.1056	16.27	0.8306	0.1626	0.8463	11.08
7.35	0.1016	0.0294	0.1058	16.15	0.8317	0.1615	0.8473	10.99
7.40	0.1018	0.0292	0.1059	16.02	0.8329	0.1605	0.8482	10.91
7.45	0.1020	0.0291	0.1061	15.89	0.8340	0.1594	0.8491	10.82
7.50	0.1023	0.0289	0.1063	15.77	0.8352	0.1584	0.8501	10.74
7.55	0.1025	0.0287	0.1064	15.65	0.8363	0.1574	0.8510	10.66
7.60	0.1027	0.0285	0.1066	15.53	0.8374	0.1564	0.8519	10.58
7.65	0.1029	0.0284	0.1067	15.41	0.8385	0.1554	0.8528	10.50
7.70	0.1031	0.0282	0.1069	15.30	0.8395	0.1545	0.8536	10.43
7.75	0.1033	0.0280	0.1070	15.18	0.8406	0.1535	0.8545	10.35
7.80	0.1035	0.0279	0.1072	15.07	0.8416	0.1526	0.8554	10.27
7.85	0.1037	0.0277	0.1073	14.96	0.8427	0.1516	0.8562	10.20
7.90	0.1039	0.0276	0.1075	14.85	0.8437	0.1507	0.8570	10.13
7.95	0.1041	0.0274	0.1076	14.75	0.8447	0.1498	0.8579	10.06
8.00	0.1043	0.0272	0.1078	14.64	0.8457	0.1489	0.8587	9.98
8.05	0.1045	0.0271	0.1079	14.53	0.8466	0.1480	0.8595	9.91
8.10	0.1047	0.0269	0.1081	14.43	0.8476	0.1471	0.8603	9.85
8.15	0.1048	0.0268	0.1082	14.33	0.8486	0.1462	0.8611	9.78
8.20	0.1050	0.0266	0.1083	14.23	0.8495	0.1454	0.8618	9.71
8.25	0.1052	0.0265	0.1085	14.13	0.8504	0.1445	0.8626	9.64
8.30	0.1054	0.0263	0.1086	14.03	0.8513	0.1437	0.8634	9.58
8.35	0.1056	0.0262	0.1088	13.94	0.8522	0.1428	0.8641	9.52
8.40	0.1057	0.0261	0.1089	13.84	0.8531	0.1420	0.8649	9.45
8.45	0.1059	0.0259	0.1090	13.75	0.8540	0.1412	0.8656	9.39
8.50	0.1061	0.0258	0.1091	13.66	0.8549	0.1404	0.8663	9.33
8.55	0.1062	0.0256	0.1093	13.57	0.8557	0.1396	0.8671	9.27
8.60	0.1064	0.0255	0.1094	13.48	0.8566	0.1388	0.8678	9.21
8.65	0.1066	0.0254	0.1095	13.39	0.8574	0.1381	0.8685	9.15
8.70	0.1067	0.0252	0.1097	13.30	0.8583	0.1373	0.8692	9.09
8.75	0.1069	0.0251	0.1098	13.21	0.8591	0.1365	0.8699	9.03
8.80	0.1070	0.0250	0.1099	13.13	0.8599	0.1358	0.8706	8.97
8.85	0.1072	0.0248	0.1100	13.04	0.8607	0.1350	0.8712	8.92
8.90	0.1073	0.0247	0.1101	12.96	0.8615	0.1343	0.8719	8.86
8.95	0.1075	0.0246	0.1103	12.88	0.8623	0.1336	0.8726	8.80
9.00	0.1076	0.0245	0.1104	12.80	0.8631	0.1328	0.8732	8.75
9.05	0.1078	0.0243	0.1105	12.72	0.8638	0.1321	0.8739	8.70
9.10	0.1079	0.0242	0.1106	12.64	0.8646	0.1314	0.8745	8.64
9.15	0.1081	0.0241	0.1107	12.56	0.8653	0.1307	0.8752	8.59
9.20	0.1082	0.0240	0.1108	12.48	0.8661	0.1300	0.8758	8.54
9.25	0.1084	0.0238	0.1110	12.41	0.8668	0.1294	0.8764	8.49
9.30	0.1085	0.0237	0.1111	12.33	0.8675	0.1287	0.8770	8.44
9.35	0.1086	0.0236	0.1112	12.26	0.8683	0.1280	0.8776	8.39
9.40	0.1088	0.0235	0.1113	12.18	0.8690	0.1274	0.8782	8.34
9.45	0.1089	0.0234	0.1114	12.11	0.8697	0.1267	0.8788	8.29
9.50	0.1090	0.0233	0.1115	12.04	0.8704	0.1260	0.8794	8.24
9.55	0.1092	0.0231	0.1116	11.97	0.8710	0.1254	0.8800	8.19
9.60	0.1093	0.0230	0.1117	11.90	0.8717	0.1248	0.8806	8.15
9.65	0.1094	0.0229	0.1118	11.83	0.8724	0.1241	0.8812	8.10
9.70	0.1096	0.0228	0.1119	11.76	0.8731	0.1235	0.8818	8.05
9.75	0.1097	0.0227	0.1120	11.69	0.8737	0.1229	0.8823	8.01
9.80	0.1098	0.0226	0.1121	11.63	0.8744	0.1223	0.8829	7.96
9.85	0.1099	0.0225	0.1122	11.56	0.8750	0.1217	0.8834	7.92
9.90	0.1101	0.0224	0.1123	11.49	0.8757	0.1211	0.8840	7.87
9.95	0.1102	0.0223	0.1124	11.43	0.8763	0.1205	0.8845	7.83
10.00	0.1103	0.0222	0.1125	11.36	0.8769	0.1199	0.8851	7.79

$k = -5.0 \qquad \sigma = 0.50$

a	$\frac{1-\sigma^2}{2}\cdot X$ REAL	$\frac{1-\sigma^2}{2}\cdot X$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
1.00	1.0130	-5.9810	0.5315	5.3085	0.0049	1.0036	-0.0028	1.0036	359.84
1.05	1.0151	-5.4225	0.5533	5.2161	0.0054	1.0040	-0.0036	1.0040	359.80
1.10	1.0172	-4.9386	0.5745	5.1209	0.0060	1.0044	-0.0045	1.0044	359.75
1.15	1.0194	-4.5165	0.5950	5.0231	0.0066	1.0048	-0.0054	1.0048	359.69
1.20	1.0216	-4.1463	0.6148	4.9229	0.0073	1.0051	-0.0066	1.0051	359.63
1.25	1.0238	-3.8198	0.6338	4.8209	0.0081	1.0053	-0.0078	1.0054	359.56
1.30	1.0260	-3.5305	0.6521	4.7172	0.0089	1.0054	-0.0091	1.0055	359.48
1.35	1.0281	-3.2730	0.6697	4.6123	0.0099	1.0055	-0.0105	1.0055	359.40
1.40	1.0301	-3.0429	0.6866	4.5065	0.0110	1.0053	-0.0119	1.0054	359.32
1.45	1.0319	-2.8364	0.7027	4.4001	0.0123	1.0051	-0.0134	1.0052	359.24
1.50	1.0337	-2.6504	0.7181	4.2936	0.0137	1.0047	-0.0149	1.0048	359.15
1.55	1.0353	-2.4824	0.7327	4.1872	0.0152	1.0042	-0.0164	1.0044	359.06
1.60	1.0368	-2.3301	0.7467	4.0813	0.0169	1.0036	-0.0179	1.0037	358.98
1.65	1.0382	-2.1916	0.7599	3.9761	0.0188	1.0028	-0.0194	1.0030	358.89
1.70	1.0394	-2.0654	0.7725	3.8719	0.0208	1.0020	-0.0208	1.0022	358.81
1.75	1.0406	-1.9500	0.7844	3.7689	0.0231	1.0010	-0.0222	1.0012	358.73
1.80	1.0416	-1.8442	0.7956	3.6675	0.0255	0.9999	-0.0235	1.0002	358.66
1.85	1.0424	-1.7471	0.8062	3.5677	0.0282	0.9988	-0.0247	0.9991	358.58
1.90	1.0432	-1.6577	0.8162	3.4697	0.0311	0.9975	-0.0258	0.9979	358.52
1.95	1.0439	-1.5752	0.8257	3.3738	0.0343	0.9962	-0.0269	0.9966	358.45
2.00	1.0444	-1.4990	0.8346	3.2801	0.0376	0.9949	-0.0279	0.9953	358.39
2.05	1.0449	-1.4284	0.8429	3.1886	0.0412	0.9935	-0.0288	0.9939	358.34
2.10	1.0453	-1.3629	0.8508	3.0994	0.0451	0.9921	-0.0296	0.9925	358.29
2.15	1.0456	-1.3020	0.8582	3.0126	0.0492	0.9906	-0.0303	0.9911	358.25
2.20	1.0458	-1.2454	0.8651	2.9284	0.0535	0.9892	-0.0309	0.9897	358.21
2.25	1.0460	-1.1926	0.8717	2.8466	0.0580	0.9877	-0.0314	0.9882	358.18
2.30	1.0461	-1.1433	0.8778	2.7673	0.0628	0.9863	-0.0318	0.9868	358.15
2.35	1.0461	-1.0972	0.8835	2.6906	0.0678	0.9848	-0.0322	0.9854	358.13
2.40	1.0461	-1.0540	0.8889	2.6165	0.0731	0.9834	-0.0325	0.9839	358.11
2.45	1.0460	-1.0136	0.8940	2.5448	0.0785	0.9820	-0.0327	0.9826	358.09
2.50	1.0459	-0.9756	0.8987	2.4756	0.0841	0.9806	-0.0329	0.9812	358.08
2.55	1.0457	-0.9399	0.9032	2.4089	0.0899	0.9793	-0.0330	0.9799	358.07
2.60	1.0454	-0.9064	0.9074	2.3445	0.0959	0.9780	-0.0330	0.9786	358.07
2.65	1.0451	-0.8748	0.9113	2.2826	0.1020	0.9767	-0.0330	0.9773	358.07
2.70	1.0448	-0.8450	0.9151	2.2229	0.1083	0.9755	-0.0329	0.9761	358.07
2.75	1.0444	-0.8169	0.9186	2.1655	0.1147	0.9743	-0.0328	0.9749	358.07
2.80	1.0440	-0.7904	0.9219	2.1103	0.1212	0.9732	-0.0327	0.9737	358.08
2.85	1.0435	-0.7653	0.9250	2.0572	0.1278	0.9721	-0.0325	0.9726	358.08
2.90	1.0430	-0.7416	0.9279	2.0061	0.1345	0.9710	-0.0323	0.9716	358.09
2.95	1.0424	-0.7191	0.9307	1.9570	0.1413	0.9700	-0.0321	0.9705	358.11
3.00	1.0418	-0.6978	0.9334	1.9099	0.1481	0.9690	-0.0318	0.9695	358.12
3.05	1.0412	-0.6776	0.9359	1.8646	0.1550	0.9681	-0.0316	0.9686	358.13
3.10	1.0405	-0.6585	0.9382	1.8210	0.1619	0.9672	-0.0313	0.9677	358.15
3.15	1.0398	-0.6402	0.9405	1.7792	0.1688	0.9663	-0.0310	0.9668	358.16
3.20	1.0391	-0.6229	0.9427	1.7391	0.1757	0.9655	-0.0307	0.9660	358.18
3.25	1.0383	-0.6064	0.9447	1.7005	0.1826	0.9647	-0.0304	0.9651	358.19
3.30	1.0375	-0.5908	0.9467	1.6634	0.1895	0.9639	-0.0301	0.9644	358.21
3.35	1.0367	-0.5758	0.9486	1.6278	0.1964	0.9632	-0.0298	0.9636	358.23
3.40	1.0358	-0.5615	0.9504	1.5936	0.2032	0.9625	-0.0295	0.9629	358.24
3.45	1.0349	-0.5479	0.9522	1.5607	0.2100	0.9618	-0.0292	0.9622	358.26
3.50	1.0340	-0.5349	0.9539	1.5291	0.2167	0.9611	-0.0289	0.9616	358.28
3.55	1.0330	-0.5225	0.9555	1.4987	0.2234	0.9605	-0.0286	0.9609	358.30
3.60	1.0320	-0.5106	0.9571	1.4694	0.2301	0.9599	-0.0282	0.9603	358.31
3.65	1.0310	-0.4993	0.9586	1.4413	0.2366	0.9594	-0.0279	0.9598	358.33
3.70	1.0300	-0.4884	0.9601	1.4143	0.2431	0.9588	-0.0276	0.9592	358.35
3.75	1.0289	-0.4780	0.9615	1.3882	0.2495	0.9583	-0.0273	0.9587	358.37
3.80	1.0278	-0.4680	0.9629	1.3631	0.2559	0.9578	-0.0270	0.9581	358.38
3.85	1.0267	-0.4584	0.9642	1.3389	0.2621	0.9573	-0.0267	0.9576	358.40
3.90	1.0256	-0.4492	0.9656	1.3157	0.2683	0.9568	-0.0264	0.9572	358.42
3.95	1.0244	-0.4403	0.9669	1.2932	0.2744	0.9563	-0.0262	0.9567	358.43

$k = -5.0$				$\sigma = 0.50$				
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0036	0.0028	0.0045	141.77	0.0171	0.1247	0.1259	82.20
1.05	-0.0040	0.0036	0.0054	138.34	0.0210	0.1372	0.1388	81.30
1.10	-0.0044	0.0045	0.0063	134.87	0.0256	0.1501	0.1523	80.33
1.15	-0.0048	0.0054	0.0073	131.38	0.0309	0.1635	0.1663	79.31
1.20	-0.0051	0.0066	0.0083	127.88	0.0369	0.1771	0.1809	78.23
1.25	-0.0053	0.0078	0.0094	124.40	0.0438	0.1910	0.1959	77.09
1.30	-0.0054	0.0091	0.0106	120.94	0.0515	0.2050	0.2113	75.90
1.35	-0.0055	0.0105	0.0118	117.52	0.0601	0.2190	0.2271	74.67
1.40	-0.0053	0.0119	0.0130	114.15	0.0695	0.2330	0.2432	73.39
1.45	-0.0051	0.0134	0.0143	110.84	0.0799	0.2469	0.2595	72.08
1.50	-0.0047	0.0149	0.0156	107.60	0.0911	0.2605	0.2760	70.73
1.55	-0.0042	0.0164	0.0169	104.43	0.1031	0.2738	0.2925	69.36
1.60	-0.0036	0.0179	0.0182	101.34	0.1160	0.2866	0.3091	67.97
1.65	-0.0028	0.0194	0.0196	98.34	0.1296	0.2989	0.3257	66.56
1.70	-0.0020	0.0208	0.0209	95.41	0.1439	0.3105	0.3422	65.14
1.75	-0.0010	0.0222	0.0222	92.56	0.1588	0.3215	0.3586	63.72
1.80	0.0001	0.0235	0.0235	89.81	0.1742	0.3318	0.3747	62.30
1.85	0.0012	0.0247	0.0247	87.13	0.1901	0.3413	0.3907	60.88
1.90	0.0025	0.0258	0.0260	84.54	0.2064	0.3499	0.4063	59.46
1.95	0.0038	0.0269	0.0272	82.03	0.2230	0.3578	0.4216	58.06
2.00	0.0051	0.0279	0.0284	79.60	0.2398	0.3647	0.4365	56.67
2.05	0.0065	0.0288	0.0295	77.25	0.2567	0.3708	0.4510	55.30
2.10	0.0079	0.0296	0.0306	74.98	0.2737	0.3761	0.4651	53.95
2.15	0.0094	0.0303	0.0317	72.79	0.2906	0.3805	0.4787	52.63
2.20	0.0108	0.0309	0.0327	70.68	0.3074	0.3840	0.4919	51.32
2.25	0.0123	0.0314	0.0337	68.64	0.3240	0.3869	0.5046	50.05
2.30	0.0137	0.0318	0.0347	66.67	0.3405	0.3889	0.5169	48.80
2.35	0.0152	0.0322	0.0356	64.77	0.3566	0.3903	0.5286	47.58
2.40	0.0166	0.0325	0.0365	62.95	0.3724	0.3910	0.5399	46.40
2.45	0.0180	0.0327	0.0373	61.19	0.3878	0.3910	0.5507	45.24
2.50	0.0194	0.0329	0.0381	59.50	0.4028	0.3906	0.5611	44.11
2.55	0.0207	0.0330	0.0389	57.87	0.4174	0.3895	0.5709	43.02
2.60	0.0220	0.0330	0.0396	56.30	0.4315	0.3881	0.5804	41.96
2.65	0.0233	0.0330	0.0404	54.80	0.4452	0.3862	0.5894	40.94
2.70	0.0245	0.0329	0.0410	53.35	0.4584	0.3839	0.5980	39.94
2.75	0.0257	0.0328	0.0417	51.96	0.4712	0.3813	0.6061	38.98
2.80	0.0268	0.0327	0.0423	50.62	0.4835	0.3784	0.6139	38.05
2.85	0.0279	0.0325	0.0429	49.34	0.4953	0.3753	0.6214	37.15
2.90	0.0290	0.0323	0.0434	48.11	0.5066	0.3719	0.6285	36.28
2.95	0.0300	0.0321	0.0439	46.92	0.5175	0.3684	0.6352	35.45
3.00	0.0310	0.0318	0.0444	45.78	0.5279	0.3647	0.6416	34.64
3.05	0.0319	0.0316	0.0449	44.69	0.5379	0.3609	0.6478	33.86
3.10	0.0328	0.0313	0.0454	43.64	0.5475	0.3570	0.6536	33.11
3.15	0.0337	0.0310	0.0458	42.63	0.5567	0.3530	0.6592	32.38
3.20	0.0345	0.0307	0.0462	41.67	0.5655	0.3490	0.6645	31.68
3.25	0.0353	0.0304	0.0466	40.74	0.5739	0.3450	0.6696	31.01
3.30	0.0361	0.0301	0.0470	39.84	0.5820	0.3410	0.6745	30.36
3.35	0.0368	0.0298	0.0474	38.99	0.5897	0.3369	0.6792	29.74
3.40	0.0375	0.0295	0.0477	38.16	0.5971	0.3329	0.6837	29.14
3.45	0.0382	0.0292	0.0481	37.37	0.6043	0.3289	0.6880	28.56
3.50	0.0389	0.0289	0.0484	36.61	0.6111	0.3249	0.6921	28.00
3.55	0.0395	0.0286	0.0487	35.87	0.6176	0.3210	0.6960	27.46
3.60	0.0401	0.0282	0.0490	35.17	0.6239	0.3171	0.6998	26.94
3.65	0.0406	0.0279	0.0493	34.49	0.6299	0.3133	0.7035	26.44
3.70	0.0412	0.0276	0.0496	33.84	0.6357	0.3095	0.7071	25.96
3.75	0.0417	0.0273	0.0499	33.21	0.6413	0.3058	0.7105	25.50
3.80	0.0422	0.0270	0.0501	32.61	0.6467	0.3022	0.7138	25.05
3.85	0.0427	0.0267	0.0504	32.02	0.6518	0.2987	0.7170	24.62
3.90	0.0432	0.0264	0.0507	31.46	0.6568	0.2952	0.7201	24.20
3.95	0.0437	0.0262	0.0509	30.92	0.6616	0.2918	0.7231	23.80

$k = -5.0$ $\sigma = 0.50$									
a	$\frac{1-\sigma^2}{2} \cdot x$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	1.0232	-0.4318	0.9681	1.2716	0.2804	0.9559	-0.0259	0.9562	358.45
4.05	1.0220	-0.4237	0.9694	1.2507	0.2863	0.9555	-0.0256	0.9558	358.47
4.10	1.0208	-0.4158	0.9706	1.2305	0.2922	0.9551	-0.0253	0.9554	358.48
4.15	1.0196	-0.4082	0.9718	1.2110	0.2979	0.9547	-0.0251	0.9550	358.50
4.20	1.0184	-0.4009	0.9729	1.1922	0.3036	0.9543	-0.0248	0.9546	358.51
4.25	1.0171	-0.3938	0.9741	1.1740	0.3091	0.9539	-0.0246	0.9542	358.53
4.30	1.0159	-0.3870	0.9752	1.1564	0.3146	0.9535	-0.0243	0.9538	358.54
4.35	1.0146	-0.3805	0.9763	1.1394	0.3200	0.9532	-0.0241	0.9535	358.55
4.40	1.0133	-0.3741	0.9774	1.1229	0.3253	0.9528	-0.0238	0.9531	358.57
4.45	1.0120	-0.3680	0.9785	1.1069	0.3306	0.9525	-0.0236	0.9528	358.58
4.50	1.0108	-0.3621	0.9795	1.0914	0.3357	0.9522	-0.0234	0.9525	358.59
4.55	1.0095	-0.3563	0.9806	1.0764	0.3408	0.9519	-0.0231	0.9521	358.61
4.60	1.0081	-0.3508	0.9816	1.0618	0.3458	0.9516	-0.0229	0.9518	358.62
4.65	1.0068	-0.3454	0.9826	1.0477	0.3507	0.9512	-0.0227	0.9515	358.63
4.70	1.0055	-0.3402	0.9836	1.0340	0.3556	0.9510	-0.0225	0.9512	358.64
4.75	1.0042	-0.3351	0.9846	1.0206	0.3604	0.9507	-0.0223	0.9509	358.66
4.80	1.0029	-0.3302	0.9856	1.0077	0.3651	0.9504	-0.0221	0.9506	358.67
4.85	1.0016	-0.3254	0.9866	0.9950	0.3697	0.9501	-0.0219	0.9504	358.68
4.90	1.0003	-0.3208	0.9875	0.9828	0.3743	0.9499	-0.0217	0.9501	358.69
4.95	0.9990	-0.3163	0.9885	0.9708	0.3788	0.9496	-0.0215	0.9498	358.70
5.00	0.9977	-0.3119	0.9894	0.9592	0.3832	0.9493	-0.0213	0.9496	358.71
5.05	0.9964	-0.3076	0.9904	0.9478	0.3876	0.9491	-0.0212	0.9493	358.72
5.10	0.9951	-0.3035	0.9913	0.9368	0.3919	0.9488	-0.0210	0.9491	358.73
5.15	0.9938	-0.2994	0.9922	0.9260	0.3961	0.9486	-0.0208	0.9488	358.74
5.20	0.9925	-0.2955	0.9931	0.9154	0.4003	0.9484	-0.0206	0.9486	358.75
5.25	0.9912	-0.2916	0.9939	0.9052	0.4045	0.9481	-0.0205	0.9484	358.76
5.30	0.9899	-0.2879	0.9948	0.8951	0.4086	0.9479	-0.0203	0.9481	358.77
5.35	0.9887	-0.2843	0.9957	0.8853	0.4126	0.9477	-0.0201	0.9479	358.78
5.40	0.9874	-0.2807	0.9965	0.8757	0.4166	0.9475	-0.0200	0.9477	358.79
5.45	0.9862	-0.2772	0.9974	0.8664	0.4205	0.9473	-0.0198	0.9475	358.80
5.50	0.9849	-0.2738	0.9982	0.8572	0.4244	0.9470	-0.0197	0.9472	358.81
5.55	0.9837	-0.2705	0.9990	0.8482	0.4282	0.9468	-0.0195	0.9470	358.82
5.60	0.9825	-0.2673	0.9998	0.8394	0.4320	0.9466	-0.0194	0.9468	358.83
5.65	0.9813	-0.2641	1.0006	0.8308	0.4357	0.9464	-0.0192	0.9466	358.84
5.70	0.9801	-0.2610	1.0014	0.8224	0.4394	0.9462	-0.0191	0.9464	358.85
5.75	0.9789	-0.2580	1.0022	0.8142	0.4430	0.9460	-0.0189	0.9462	358.85
5.80	0.9777	-0.2551	1.0030	0.8061	0.4466	0.9459	-0.0188	0.9460	358.86
5.85	0.9765	-0.2522	1.0037	0.7982	0.4501	0.9457	-0.0187	0.9459	358.87
5.90	0.9754	-0.2494	1.0045	0.7904	0.4537	0.9455	-0.0185	0.9457	358.88
5.95	0.9742	-0.2466	1.0052	0.7828	0.4571	0.9453	-0.0184	0.9455	358.89
6.00	0.9731	-0.2439	1.0060	0.7753	0.4605	0.9451	-0.0182	0.9453	358.89
6.05	0.9720	-0.2412	1.0067	0.7680	0.4639	0.9450	-0.0181	0.9451	358.90
6.10	0.9709	-0.2386	1.0074	0.7608	0.4673	0.9448	-0.0180	0.9450	358.91
6.15	0.9698	-0.2361	1.0081	0.7538	0.4706	0.9446	-0.0179	0.9448	358.92
6.20	0.9687	-0.2336	1.0088	0.7468	0.4739	0.9445	-0.0177	0.9446	358.92
6.25	0.9676	-0.2311	1.0095	0.7400	0.4771	0.9443	-0.0176	0.9445	358.93
6.30	0.9665	-0.2287	1.0102	0.7334	0.4803	0.9441	-0.0175	0.9443	358.94
6.35	0.9655	-0.2264	1.0109	0.7268	0.4835	0.9440	-0.0174	0.9441	358.95
6.40	0.9644	-0.2241	1.0116	0.7203	0.4866	0.9438	-0.0172	0.9440	358.95
6.45	0.9634	-0.2218	1.0122	0.7140	0.4897	0.9437	-0.0171	0.9438	358.96
6.50	0.9624	-0.2196	1.0129	0.7078	0.4927	0.9435	-0.0170	0.9437	358.97
6.55	0.9614	-0.2174	1.0135	0.7017	0.4958	0.9434	-0.0169	0.9435	358.97
6.60	0.9604	-0.2153	1.0141	0.6956	0.4988	0.9432	-0.0168	0.9434	358.98
6.65	0.9594	-0.2132	1.0148	0.6897	0.5017	0.9431	-0.0167	0.9432	358.99
6.70	0.9584	-0.2111	1.0154	0.6839	0.5046	0.9429	-0.0166	0.9431	358.99
6.75	0.9575	-0.2091	1.0160	0.6782	0.5075	0.9428	-0.0165	0.9429	359.00
6.80	0.9565	-0.2071	1.0166	0.6726	0.5104	0.9427	-0.0164	0.9428	359.01
6.85	0.9556	-0.2052	1.0172	0.6670	0.5132	0.9425	-0.0162	0.9427	359.01
6.90	0.9546	-0.2033	1.0178	0.6616	0.5160	0.9424	-0.0161	0.9425	359.02
6.95	0.9537	-0.2014	1.0184	0.6562	0.5188	0.9423	-0.0160	0.9424	359.03

$k = -5.0$					$\sigma = 0.50$			
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.0441	0.0259	0.0511	30.40	0.6663	0.2884	0.7260	23.41
4.05	0.0445	0.0256	0.0514	29.89	0.6708	0.2852	0.7289	23.03
4.10	0.0449	0.0253	0.0516	29.41	0.6751	0.2820	0.7316	22.67
4.15	0.0453	0.0251	0.0518	28.93	0.6793	0.2789	0.7343	22.32
4.20	0.0457	0.0248	0.0520	28.48	0.6834	0.2758	0.7369	21.98
4.25	0.0461	0.0246	0.0522	28.04	0.6873	0.2728	0.7395	21.65
4.30	0.0465	0.0243	0.0524	27.62	0.6912	0.2699	0.7420	21.33
4.35	0.0468	0.0241	0.0526	27.20	0.6949	0.2671	0.7445	21.03
4.40	0.0472	0.0238	0.0528	26.81	0.6985	0.2643	0.7468	20.73
4.45	0.0475	0.0236	0.0530	26.42	0.7020	0.2616	0.7492	20.44
4.50	0.0478	0.0234	0.0532	26.04	0.7055	0.2589	0.7515	20.16
4.55	0.0481	0.0231	0.0534	25.68	0.7088	0.2564	0.7537	19.88
4.60	0.0484	0.0229	0.0536	25.33	0.7121	0.2538	0.7559	19.62
4.65	0.0488	0.0227	0.0538	24.99	0.7152	0.2513	0.7581	19.36
4.70	0.0490	0.0225	0.0540	24.65	0.7183	0.2489	0.7602	19.11
4.75	0.0493	0.0223	0.0541	24.33	0.7214	0.2465	0.7623	18.87
4.80	0.0496	0.0221	0.0543	24.02	0.7243	0.2442	0.7644	18.63
4.85	0.0499	0.0219	0.0545	23.71	0.7272	0.2420	0.7664	18.40
4.90	0.0501	0.0217	0.0547	23.42	0.7300	0.2397	0.7684	18.18
4.95	0.0504	0.0215	0.0548	23.13	0.7328	0.2376	0.7703	17.96
5.00	0.0507	0.0213	0.0550	22.84	0.7355	0.2354	0.7723	17.75
5.05	0.0509	0.0212	0.0551	22.57	0.7381	0.2333	0.7741	17.54
5.10	0.0512	0.0210	0.0553	22.30	0.7407	0.2313	0.7760	17.34
5.15	0.0514	0.0208	0.0555	22.04	0.7433	0.2293	0.7778	17.14
5.20	0.0516	0.0206	0.0556	21.79	0.7458	0.2273	0.7796	16.95
5.25	0.0519	0.0205	0.0558	21.54	0.7482	0.2254	0.7814	16.76
5.30	0.0521	0.0203	0.0559	21.29	0.7506	0.2235	0.7832	16.58
5.35	0.0523	0.0201	0.0561	21.06	0.7530	0.2216	0.7849	16.40
5.40	0.0525	0.0200	0.0562	20.82	0.7553	0.2198	0.7866	16.22
5.45	0.0527	0.0198	0.0564	20.60	0.7576	0.2180	0.7883	16.05
5.50	0.0530	0.0197	0.0565	20.38	0.7598	0.2162	0.7899	15.88
5.55	0.0532	0.0195	0.0566	20.16	0.7620	0.2144	0.7916	15.72
5.60	0.0534	0.0194	0.0568	19.95	0.7641	0.2127	0.7932	15.56
5.65	0.0536	0.0192	0.0569	19.74	0.7662	0.2111	0.7948	15.40
5.70	0.0538	0.0191	0.0570	19.53	0.7683	0.2094	0.7963	15.25
5.75	0.0540	0.0189	0.0572	19.34	0.7704	0.2078	0.7979	15.09
5.80	0.0541	0.0188	0.0573	19.14	0.7724	0.2062	0.7994	14.95
5.85	0.0543	0.0187	0.0574	18.95	0.7743	0.2046	0.8009	14.80
5.90	0.0545	0.0185	0.0576	18.76	0.7763	0.2030	0.8024	14.66
5.95	0.0547	0.0184	0.0577	18.58	0.7782	0.2015	0.8038	14.52
6.00	0.0549	0.0182	0.0578	18.40	0.7801	0.2000	0.8053	14.38
6.05	0.0550	0.0181	0.0579	18.22	0.7819	0.1985	0.8067	14.25
6.10	0.0552	0.0180	0.0581	18.05	0.7837	0.1970	0.8081	14.11
6.15	0.0554	0.0179	0.0582	17.88	0.7855	0.1956	0.8095	13.98
6.20	0.0555	0.0177	0.0583	17.71	0.7873	0.1942	0.8108	13.86
6.25	0.0557	0.0176	0.0584	17.54	0.7890	0.1928	0.8122	13.73
6.30	0.0559	0.0175	0.0585	17.38	0.7907	0.1914	0.8135	13.61
6.35	0.0560	0.0174	0.0587	17.22	0.7924	0.1900	0.8148	13.49
6.40	0.0562	0.0172	0.0588	17.07	0.7940	0.1887	0.8161	13.37
6.45	0.0563	0.0171	0.0589	16.92	0.7956	0.1874	0.8174	13.25
6.50	0.0565	0.0170	0.0590	16.76	0.7972	0.1860	0.8186	13.14
6.55	0.0566	0.0169	0.0591	16.62	0.7988	0.1848	0.8199	13.02
6.60	0.0568	0.0168	0.0592	16.47	0.8003	0.1835	0.8211	12.91
6.65	0.0569	0.0167	0.0593	16.33	0.8019	0.1822	0.8223	12.80
6.70	0.0571	0.0166	0.0594	16.19	0.8034	0.1810	0.8235	12.70
6.75	0.0572	0.0165	0.0595	16.05	0.8048	0.1798	0.8247	12.59
6.80	0.0573	0.0164	0.0596	15.92	0.8063	0.1785	0.8258	12.49
6.85	0.0575	0.0162	0.0597	15.78	0.8077	0.1774	0.8270	12.38
6.90	0.0576	0.0161	0.0598	15.65	0.8092	0.1762	0.8281	12.28
6.95	0.0577	0.0160	0.0599	15.52	0.8106	0.1750	0.8292	12.18

$k = -5.0$						$\sigma = 0.50$			
a	$\frac{1-\sigma^2}{2}\cdot X$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.9528	-0.1996	1.0189	0.6509	0.5216	0.9421	-0.0159	0.9423	359.03
7.05	0.9519	-0.1978	1.0195	0.6458	0.5243	0.9420	-0.0158	0.9421	359.04
7.10	0.9510	-0.1960	1.0201	0.6406	0.5270	0.9419	-0.0157	0.9420	359.04
7.15	0.9502	-0.1942	1.0206	0.6356	0.5296	0.9418	-0.0156	0.9419	359.05
7.20	0.9493	-0.1925	1.0212	0.6307	0.5322	0.9416	-0.0155	0.9418	359.05
7.25	0.9484	-0.1908	1.0217	0.6258	0.5348	0.9415	-0.0154	0.9416	359.06
7.30	0.9476	-0.1891	1.0223	0.6210	0.5374	0.9414	-0.0153	0.9415	359.07
7.35	0.9467	-0.1875	1.0228	0.6162	0.5400	0.9413	-0.0153	0.9414	359.07
7.40	0.9459	-0.1859	1.0233	0.6116	0.5425	0.9412	-0.0152	0.9413	359.08
7.45	0.9451	-0.1843	1.0238	0.6070	0.5450	0.9411	-0.0151	0.9412	359.08
7.50	0.9443	-0.1828	1.0243	0.6025	0.5475	0.9409	-0.0150	0.9411	359.09
7.55	0.9435	-0.1812	1.0248	0.5980	0.5499	0.9408	-0.0149	0.9409	359.09
7.60	0.9427	-0.1797	1.0253	0.5936	0.5523	0.9407	-0.0148	0.9408	359.10
7.65	0.9419	-0.1782	1.0258	0.5893	0.5547	0.9406	-0.0147	0.9407	359.10
7.70	0.9411	-0.1768	1.0263	0.5850	0.5571	0.9405	-0.0146	0.9406	359.11
7.75	0.9404	-0.1754	1.0268	0.5808	0.5594	0.9404	-0.0145	0.9405	359.11
7.80	0.9396	-0.1739	1.0273	0.5767	0.5618	0.9403	-0.0145	0.9404	359.12
7.85	0.9388	-0.1725	1.0278	0.5726	0.5641	0.9402	-0.0144	0.9403	359.12
7.90	0.9381	-0.1712	1.0282	0.5686	0.5663	0.9401	-0.0143	0.9402	359.13
7.95	0.9374	-0.1698	1.0287	0.5646	0.5686	0.9400	-0.0142	0.9401	359.13
8.00	0.9366	-0.1685	1.0291	0.5607	0.5708	0.9399	-0.0141	0.9400	359.14
8.05	0.9359	-0.1672	1.0296	0.5568	0.5730	0.9398	-0.0140	0.9399	359.14
8.10	0.9352	-0.1659	1.0300	0.5530	0.5752	0.9397	-0.0140	0.9398	359.15
8.15	0.9345	-0.1646	1.0305	0.5492	0.5774	0.9396	-0.0139	0.9397	359.15
8.20	0.9338	-0.1634	1.0309	0.5455	0.5795	0.9395	-0.0138	0.9396	359.16
8.25	0.9331	-0.1622	1.0314	0.5419	0.5817	0.9394	-0.0137	0.9395	359.16
8.30	0.9325	-0.1609	1.0318	0.5383	0.5838	0.9393	-0.0137	0.9394	359.17
8.35	0.9318	-0.1597	1.0322	0.5347	0.5858	0.9392	-0.0136	0.9393	359.17
8.40	0.9311	-0.1586	1.0326	0.5312	0.5879	0.9392	-0.0135	0.9393	359.18
8.45	0.9305	-0.1574	1.0330	0.5277	0.5900	0.9391	-0.0134	0.9392	359.18
8.50	0.9298	-0.1563	1.0334	0.5243	0.5920	0.9390	-0.0134	0.9391	359.18
8.55	0.9292	-0.1551	1.0339	0.5209	0.5940	0.9389	-0.0133	0.9390	359.19
8.60	0.9285	-0.1540	1.0343	0.5176	0.5960	0.9388	-0.0132	0.9389	359.19
8.65	0.9279	-0.1529	1.0347	0.5143	0.5979	0.9387	-0.0132	0.9388	359.20
8.70	0.9273	-0.1518	1.0350	0.5110	0.5999	0.9386	-0.0131	0.9387	359.20
8.75	0.9266	-0.1508	1.0354	0.5078	0.6018	0.9386	-0.0130	0.9387	359.21
8.80	0.9260	-0.1497	1.0358	0.5046	0.6037	0.9385	-0.0129	0.9386	359.21
8.85	0.9254	-0.1487	1.0362	0.5015	0.6056	0.9384	-0.0129	0.9385	359.21
8.90	0.9248	-0.1476	1.0366	0.4984	0.6075	0.9383	-0.0128	0.9384	359.22
8.95	0.9242	-0.1466	1.0370	0.4953	0.6094	0.9382	-0.0127	0.9383	359.22
9.00	0.9236	-0.1456	1.0373	0.4923	0.6112	0.9382	-0.0127	0.9383	359.23
9.05	0.9230	-0.1447	1.0377	0.4893	0.6130	0.9381	-0.0126	0.9382	359.23
9.10	0.9225	-0.1437	1.0381	0.4864	0.6148	0.9380	-0.0126	0.9381	359.23
9.15	0.9219	-0.1427	1.0384	0.4835	0.6166	0.9379	-0.0125	0.9380	359.24
9.20	0.9213	-0.1418	1.0388	0.4806	0.6184	0.9379	-0.0124	0.9380	359.24
9.25	0.9208	-0.1408	1.0391	0.4778	0.6202	0.9378	-0.0124	0.9379	359.24
9.30	0.9202	-0.1399	1.0395	0.4750	0.6219	0.9377	-0.0123	0.9378	359.25
9.35	0.9197	-0.1390	1.0398	0.4722	0.6236	0.9377	-0.0122	0.9377	359.25
9.40	0.9191	-0.1381	1.0402	0.4694	0.6254	0.9376	-0.0122	0.9377	359.26
9.45	0.9186	-0.1372	1.0405	0.4667	0.6271	0.9375	-0.0121	0.9376	359.26
9.50	0.9180	-0.1363	1.0408	0.4640	0.6287	0.9374	-0.0121	0.9375	359.26
9.55	0.9175	-0.1355	1.0412	0.4614	0.6304	0.9374	-0.0120	0.9375	359.27
9.60	0.9170	-0.1346	1.0415	0.4588	0.6321	0.9373	-0.0119	0.9374	359.27
9.65	0.9165	-0.1338	1.0418	0.4562	0.6337	0.9372	-0.0119	0.9373	359.27
9.70	0.9160	-0.1329	1.0421	0.4536	0.6353	0.9372	-0.0118	0.9372	359.28
9.75	0.9154	-0.1321	1.0425	0.4511	0.6369	0.9371	-0.0118	0.9372	359.28
9.80	0.9149	-0.1313	1.0428	0.4486	0.6385	0.9370	-0.0117	0.9371	359.28
9.85	0.9144	-0.1305	1.0431	0.4461	0.6401	0.9370	-0.0117	0.9371	359.29
9.90	0.9139	-0.1297	1.0434	0.4436	0.6417	0.9369	-0.0116	0.9370	359.29
9.95	0.9135	-0.1289	1.0437	0.4412	0.6433	0.9369	-0.0116	0.9369	359.29
10.00	0.9130	-0.1281	1.0440	0.4388	0.6448	0.9368	-0.0115	0.9369	359.30

$k = -5.0$ $\sigma = 0.50$								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.0579	0.0159	0.0600	15.40	0.8119	0.1739	0.8303	12.09
7.05	0.0580	0.0158	0.0601	15.27	0.8133	0.1727	0.8314	11.99
7.10	0.0581	0.0157	0.0602	15.15	0.8146	0.1716	0.8325	11.90
7.15	0.0582	0.0156	0.0603	15.03	0.8159	0.1705	0.8336	11.80
7.20	0.0584	0.0155	0.0604	14.91	0.8172	0.1694	0.8346	11.71
7.25	0.0585	0.0154	0.0605	14.79	0.8185	0.1683	0.8356	11.62
7.30	0.0586	0.0153	0.0606	14.67	0.8198	0.1673	0.8367	11.53
7.35	0.0587	0.0153	0.0607	14.56	0.8210	0.1662	0.8377	11.45
7.40	0.0588	0.0152	0.0608	14.45	0.8222	0.1652	0.8387	11.36
7.45	0.0589	0.0151	0.0608	14.34	0.8234	0.1642	0.8397	11.28
7.50	0.0591	0.0150	0.0609	14.23	0.8246	0.1632	0.8406	11.19
7.55	0.0592	0.0149	0.0610	14.12	0.8258	0.1622	0.8416	11.11
7.60	0.0593	0.0148	0.0611	14.02	0.8270	0.1612	0.8425	11.03
7.65	0.0594	0.0147	0.0612	13.91	0.8281	0.1602	0.8435	10.95
7.70	0.0595	0.0146	0.0613	13.81	0.8293	0.1592	0.8444	10.87
7.75	0.0596	0.0145	0.0613	13.71	0.8304	0.1583	0.8453	10.79
7.80	0.0597	0.0145	0.0614	13.61	0.8315	0.1573	0.8462	10.71
7.85	0.0598	0.0144	0.0615	13.51	0.8326	0.1564	0.8471	10.64
7.90	0.0599	0.0143	0.0616	13.41	0.8336	0.1555	0.8480	10.56
7.95	0.0600	0.0142	0.0617	13.32	0.8347	0.1546	0.8489	10.49
8.00	0.0601	0.0141	0.0617	13.23	0.8357	0.1537	0.8497	10.42
8.05	0.0602	0.0140	0.0618	13.13	0.8368	0.1528	0.8506	10.35
8.10	0.0603	0.0140	0.0619	13.04	0.8378	0.1519	0.8514	10.28
8.15	0.0604	0.0139	0.0620	12.95	0.8388	0.1510	0.8523	10.21
8.20	0.0605	0.0138	0.0620	12.86	0.8398	0.1502	0.8531	10.14
8.25	0.0606	0.0137	0.0621	12.77	0.8408	0.1493	0.8539	10.07
8.30	0.0607	0.0137	0.0622	12.69	0.8417	0.1485	0.8547	10.00
8.35	0.0608	0.0136	0.0623	12.60	0.8427	0.1476	0.8555	9.94
8.40	0.0608	0.0135	0.0623	12.52	0.8436	0.1468	0.8563	9.87
8.45	0.0609	0.0134	0.0624	12.44	0.8446	0.1460	0.8571	9.81
8.50	0.0610	0.0134	0.0625	12.35	0.8455	0.1452	0.8579	9.74
8.55	0.0611	0.0133	0.0625	12.27	0.8464	0.1444	0.8586	9.68
8.60	0.0612	0.0132	0.0626	12.19	0.8473	0.1436	0.8594	9.62
8.65	0.0613	0.0132	0.0627	12.11	0.8482	0.1428	0.8601	9.56
8.70	0.0614	0.0131	0.0627	12.04	0.8491	0.1421	0.8609	9.50
8.75	0.0614	0.0130	0.0628	11.96	0.8499	0.1413	0.8616	9.44
8.80	0.0615	0.0129	0.0629	11.88	0.8508	0.1405	0.8623	9.38
8.85	0.0616	0.0129	0.0629	11.81	0.8517	0.1398	0.8631	9.32
8.90	0.0617	0.0128	0.0630	11.73	0.8525	0.1391	0.8638	9.26
8.95	0.0618	0.0127	0.0631	11.66	0.8533	0.1383	0.8645	9.21
9.00	0.0618	0.0127	0.0631	11.59	0.8541	0.1376	0.8652	9.15
9.05	0.0619	0.0126	0.0632	11.52	0.8550	0.1369	0.8659	9.10
9.10	0.0620	0.0126	0.0632	11.45	0.8558	0.1362	0.8665	9.04
9.15	0.0621	0.0125	0.0633	11.38	0.8566	0.1355	0.8672	8.99
9.20	0.0621	0.0124	0.0634	11.31	0.8573	0.1348	0.8679	8.94
9.25	0.0622	0.0124	0.0634	11.24	0.8581	0.1341	0.8685	8.88
9.30	0.0623	0.0123	0.0635	11.17	0.8589	0.1334	0.8692	8.83
9.35	0.0623	0.0122	0.0635	11.11	0.8597	0.1328	0.8698	8.78
9.40	0.0624	0.0122	0.0636	11.04	0.8604	0.1321	0.8705	8.73
9.45	0.0625	0.0121	0.0637	10.98	0.8611	0.1314	0.8711	8.68
9.50	0.0626	0.0121	0.0637	10.91	0.8619	0.1308	0.8717	8.63
9.55	0.0626	0.0120	0.0638	10.85	0.8626	0.1301	0.8724	8.58
9.60	0.0627	0.0119	0.0638	10.79	0.8633	0.1295	0.8730	8.53
9.65	0.0628	0.0119	0.0639	10.72	0.8640	0.1289	0.8736	8.48
9.70	0.0628	0.0118	0.0639	10.66	0.8648	0.1282	0.8742	8.43
9.75	0.0629	0.0118	0.0640	10.60	0.8654	0.1276	0.8748	8.39
9.80	0.0630	0.0117	0.0640	10.54	0.8661	0.1270	0.8754	8.34
9.85	0.0630	0.0117	0.0641	10.48	0.8668	0.1264	0.8760	8.29
9.90	0.0631	0.0116	0.0641	10.43	0.8675	0.1258	0.8766	8.25
9.95	0.0631	0.0116	0.0642	10.37	0.8682	0.1252	0.8771	8.20
10.00	0.0632	0.0115	0.0642	10.31	0.8688	0.1246	0.8777	8.16

$k = -10.0$ $\sigma = 0.50$

a	$\frac{1-\sigma^2}{2} \cdot x$ REAL	$\frac{1-\sigma^2}{2} \cdot x$ IMAG.	$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$ REAL	$-\eta$ IMAG.	$-\eta$ MODULUS	$-\eta$ PHASE (DEGREES)
1.00	1.0155	-5.9890	0.5311	5.3075	0.0050	1.0022	-0.0030	1.0022	359.83
1.05	1.0170	-5.4317	0.5529	5.2159	0.0054	1.0023	-0.0036	1.0023	359.79
1.10	1.0185	-4.9489	0.5740	5.1218	0.0060	1.0024	-0.0043	1.0024	359.76
1.15	1.0198	-4.5280	0.5944	5.0254	0.0066	1.0024	-0.0050	1.0024	359.72
1.20	1.0210	-4.1587	0.6141	4.9272	0.0072	1.0023	-0.0057	1.0023	359.67
1.25	1.0221	-3.8331	0.6331	4.8273	0.0080	1.0022	-0.0065	1.0022	359.63
1.30	1.0231	-3.5446	0.6515	4.7261	0.0089	1.0020	-0.0072	1.0020	359.59
1.35	1.0239	-3.2877	0.6691	4.6240	0.0098	1.0018	-0.0080	1.0018	359.54
1.40	1.0247	-3.0580	0.6860	4.5211	0.0109	1.0014	-0.0088	1.0015	359.50
1.45	1.0253	-2.8517	0.7022	4.4179	0.0121	1.0011	-0.0095	1.0011	359.45
1.50	1.0259	-2.6660	0.7177	4.3145	0.0134	1.0007	-0.0103	1.0007	359.41
1.55	1.0264	-2.4980	0.7325	4.2113	0.0148	1.0002	-0.0110	1.0003	359.37
1.60	1.0267	-2.3457	0.7467	4.1085	0.0164	0.9997	-0.0117	0.9998	359.33
1.65	1.0270	-2.2071	0.7601	4.0063	0.0182	0.9991	-0.0124	0.9992	359.29
1.70	1.0273	-2.0807	0.7729	3.9051	0.0201	0.9985	-0.0131	0.9986	359.25
1.75	1.0275	-1.9651	0.7851	3.8049	0.0223	0.9979	-0.0137	0.9980	359.21
1.80	1.0276	-1.8591	0.7966	3.7061	0.0246	0.9972	-0.0143	0.9973	359.18
1.85	1.0277	-1.7616	0.8075	3.6087	0.0271	0.9965	-0.0148	0.9966	359.15
1.90	1.0277	-1.6719	0.8178	3.5130	0.0298	0.9958	-0.0153	0.9959	359.12
1.95	1.0277	-1.5891	0.8276	3.4192	0.0327	0.9950	-0.0158	0.9951	359.09
2.00	1.0277	-1.5125	0.8368	3.3272	0.0359	0.9943	-0.0162	0.9944	359.07
2.05	1.0276	-1.4415	0.8455	3.2373	0.0393	0.9935	-0.0166	0.9936	359.05
2.10	1.0274	-1.3757	0.8537	3.1495	0.0429	0.9927	-0.0169	0.9929	359.03
2.15	1.0273	-1.3144	0.8614	3.0640	0.0467	0.9919	-0.0172	0.9921	359.01
2.20	1.0270	-1.2574	0.8686	2.9807	0.0508	0.9911	-0.0174	0.9913	358.99
2.25	1.0268	-1.2043	0.8755	2.8998	0.0550	0.9904	-0.0176	0.9905	358.98
2.30	1.0265	-1.1546	0.8819	2.8212	0.0595	0.9896	-0.0178	0.9898	358.97
2.35	1.0262	-1.1082	0.8880	2.7450	0.0642	0.9888	-0.0179	0.9890	358.96
2.40	1.0259	-1.0647	0.8936	2.6712	0.0692	0.9881	-0.0180	0.9882	358.96
2.45	1.0255	-1.0240	0.8990	2.5998	0.0743	0.9874	-0.0181	0.9875	358.95
2.50	1.0251	-0.9857	0.9040	2.5308	0.0796	0.9866	-0.0181	0.9868	358.95
2.55	1.0247	-0.9497	0.9088	2.4640	0.0851	0.9859	-0.0181	0.9861	358.95
2.60	1.0242	-0.9159	0.9132	2.3997	0.0907	0.9853	-0.0181	0.9854	358.95
2.65	1.0237	-0.8841	0.9174	2.3375	0.0966	0.9846	-0.0181	0.9848	358.95
2.70	1.0232	-0.8540	0.9214	2.2777	0.1025	0.9840	-0.0180	0.9841	358.95
2.75	1.0226	-0.8257	0.9251	2.2200	0.1086	0.9833	-0.0179	0.9835	358.96
2.80	1.0220	-0.7989	0.9286	2.1644	0.1148	0.9827	-0.0178	0.9829	358.96
2.85	1.0214	-0.7736	0.9320	2.1109	0.1211	0.9822	-0.0177	0.9823	358.97
2.90	1.0207	-0.7497	0.9351	2.0594	0.1275	0.9816	-0.0176	0.9818	358.97
2.95	1.0201	-0.7270	0.9381	2.0099	0.1340	0.9811	-0.0174	0.9812	358.98
3.00	1.0194	-0.7055	0.9409	1.9622	0.1405	0.9806	-0.0173	0.9807	358.99
3.05	1.0186	-0.6851	0.9436	1.9164	0.1471	0.9801	-0.0171	0.9802	359.00
3.10	1.0178	-0.6657	0.9462	1.8723	0.1538	0.9796	-0.0170	0.9797	359.01
3.15	1.0170	-0.6473	0.9486	1.8300	0.1604	0.9791	-0.0168	0.9793	359.02
3.20	1.0162	-0.6298	0.9509	1.7893	0.1671	0.9787	-0.0167	0.9788	359.03
3.25	1.0153	-0.6132	0.9531	1.7501	0.1738	0.9783	-0.0165	0.9784	359.03
3.30	1.0144	-0.5973	0.9553	1.7125	0.1804	0.9779	-0.0163	0.9780	359.04
3.35	1.0135	-0.5822	0.9573	1.6763	0.1871	0.9775	-0.0161	0.9776	359.05
3.40	1.0126	-0.5678	0.9593	1.6415	0.1937	0.9771	-0.0160	0.9773	359.06
3.45	1.0116	-0.5541	0.9611	1.6080	0.2003	0.9768	-0.0158	0.9769	359.07
3.50	1.0106	-0.5410	0.9629	1.5759	0.2068	0.9764	-0.0156	0.9766	359.08
3.55	1.0096	-0.5284	0.9647	1.5449	0.2133	0.9761	-0.0154	0.9762	359.09
3.60	1.0085	-0.5164	0.9664	1.5151	0.2198	0.9758	-0.0153	0.9759	359.10
3.65	1.0075	-0.5049	0.9680	1.4865	0.2262	0.9755	-0.0151	0.9756	359.11
3.70	1.0064	-0.4940	0.9696	1.4589	0.2325	0.9752	-0.0149	0.9753	359.12
3.75	1.0052	-0.4834	0.9711	1.4323	0.2388	0.9749	-0.0148	0.9750	359.13
3.80	1.0041	-0.4733	0.9726	1.4067	0.2450	0.9746	-0.0146	0.9748	359.14
3.85	1.0029	-0.4636	0.9741	1.3820	0.2511	0.9744	-0.0144	0.9745	359.15
3.90	1.0018	-0.4543	0.9755	1.3582	0.2571	0.9741	-0.0143	0.9742	359.16
3.95	1.0006	-0.4454	0.9769	1.3353	0.2631	0.9739	-0.0141	0.9740	359.17

k = -10.0 σ = 0.50								
a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
1.00	-0.0022	0.0030	0.0037	126.47	0.0184	0.1247	0.1261	81.59
1.05	-0.0023	0.0036	0.0043	122.68	0.0227	0.1370	0.1389	80.61
1.10	-0.0024	0.0043	0.0049	119.00	0.0276	0.1497	0.1522	79.57
1.15	-0.0024	0.0050	0.0055	115.43	0.0331	0.1626	0.1660	78.48
1.20	-0.0023	0.0057	0.0062	111.98	0.0395	0.1758	0.1802	77.35
1.25	-0.0022	0.0065	0.0068	108.66	0.0465	0.1891	0.1948	76.18
1.30	-0.0020	0.0072	0.0075	105.45	0.0544	0.2025	0.2097	74.97
1.35	-0.0018	0.0080	0.0082	102.36	0.0630	0.2160	0.2250	73.73
1.40	-0.0014	0.0088	0.0089	99.38	0.0724	0.2293	0.2405	72.47
1.45	-0.0011	0.0095	0.0096	96.50	0.0826	0.2424	0.2561	71.18
1.50	-0.0007	0.0103	0.0103	93.73	0.0936	0.2553	0.2720	69.86
1.55	-0.0002	0.0110	0.0110	91.05	0.1053	0.2679	0.2879	68.54
1.60	0.0003	0.0117	0.0117	88.46	0.1178	0.2801	0.3038	67.19
1.65	0.0009	0.0124	0.0125	85.95	0.1309	0.2918	0.3198	65.84
1.70	0.0015	0.0131	0.0132	83.53	0.1446	0.3029	0.3356	64.48
1.75	0.0021	0.0137	0.0139	81.18	0.1588	0.3134	0.3514	63.12
1.80	0.0028	0.0143	0.0145	78.90	0.1736	0.3233	0.3670	61.76
1.85	0.0035	0.0148	0.0152	76.70	0.1888	0.3325	0.3823	60.41
1.90	0.0042	0.0153	0.0159	74.56	0.2044	0.3409	0.3974	59.06
1.95	0.0050	0.0158	0.0165	72.49	0.2202	0.3485	0.4123	57.72
2.00	0.0057	0.0162	0.0172	70.48	0.2362	0.3554	0.4268	56.39
2.05	0.0065	0.0166	0.0178	68.53	0.2524	0.3615	0.4409	55.08
2.10	0.0073	0.0169	0.0184	66.64	0.2687	0.3669	0.4547	53.78
2.15	0.0081	0.0172	0.0190	64.81	0.2849	0.3714	0.4681	52.51
2.20	0.0089	0.0174	0.0195	63.04	0.3011	0.3752	0.4810	51.25
2.25	0.0096	0.0176	0.0201	61.32	0.3171	0.3782	0.4936	50.02
2.30	0.0104	0.0178	0.0206	59.66	0.3330	0.3806	0.5057	48.82
2.35	0.0112	0.0179	0.0211	58.06	0.3486	0.3823	0.5173	47.64
2.40	0.0119	0.0180	0.0216	56.51	0.3639	0.3833	0.5285	46.49
2.45	0.0126	0.0181	0.0221	55.01	0.3789	0.3837	0.5393	45.37
2.50	0.0134	0.0181	0.0225	53.56	0.3935	0.3836	0.5496	44.27
2.55	0.0141	0.0181	0.0229	52.17	0.4078	0.3830	0.5595	43.21
2.60	0.0147	0.0181	0.0233	50.82	0.4216	0.3820	0.5689	42.17
2.65	0.0154	0.0181	0.0237	49.52	0.4351	0.3805	0.5780	41.17
2.70	0.0160	0.0180	0.0241	48.27	0.4481	0.3786	0.5866	40.20
2.75	0.0167	0.0179	0.0245	47.06	0.4606	0.3764	0.5949	39.25
2.80	0.0173	0.0178	0.0248	45.90	0.4728	0.3739	0.6027	38.34
2.85	0.0178	0.0177	0.0251	44.77	0.4844	0.3711	0.6103	37.45
2.90	0.0184	0.0176	0.0254	43.70	0.4957	0.3681	0.6174	36.60
2.95	0.0189	0.0174	0.0257	42.66	0.5065	0.3649	0.6243	35.77
3.00	0.0194	0.0173	0.0260	41.66	0.5169	0.3616	0.6308	34.97
3.05	0.0199	0.0171	0.0263	40.70	0.5269	0.3581	0.6371	34.20
3.10	0.0204	0.0170	0.0266	39.77	0.5365	0.3545	0.6431	33.46
3.15	0.0209	0.0168	0.0268	38.88	0.5457	0.3509	0.6488	32.74
3.20	0.0213	0.0167	0.0270	38.02	0.5545	0.3471	0.6542	32.05
3.25	0.0217	0.0165	0.0273	37.20	0.5630	0.3434	0.6594	31.38
3.30	0.0221	0.0163	0.0275	36.41	0.5711	0.3396	0.6644	30.74
3.35	0.0225	0.0161	0.0277	35.64	0.5789	0.3358	0.6692	30.11
3.40	0.0229	0.0160	0.0279	34.91	0.5864	0.3320	0.6738	29.52
3.45	0.0232	0.0158	0.0281	34.20	0.5935	0.3282	0.6782	28.94
3.50	0.0236	0.0156	0.0283	33.52	0.6004	0.3244	0.6824	28.38
3.55	0.0239	0.0154	0.0284	32.87	0.6070	0.3207	0.6865	27.84
3.60	0.0242	0.0153	0.0286	32.24	0.6134	0.3170	0.6904	27.33
3.65	0.0245	0.0151	0.0288	31.63	0.6195	0.3133	0.6942	26.83
3.70	0.0248	0.0149	0.0289	31.05	0.6254	0.3097	0.6979	26.35
3.75	0.0251	0.0148	0.0291	30.48	0.6310	0.3062	0.7014	25.88
3.80	0.0254	0.0146	0.0293	29.94	0.6365	0.3027	0.7048	25.43
3.85	0.0256	0.0144	0.0294	29.42	0.6417	0.2993	0.7081	25.00
3.90	0.0259	0.0143	0.0295	28.91	0.6468	0.2959	0.7113	24.58
3.95	0.0261	0.0141	0.0297	28.42	0.6517	0.2926	0.7144	24.18

	$k = -10.0$ $\sigma = 0.50$								
a	$\frac{1-\sigma^2}{2} \cdot x$		$\frac{1}{X}$	$2\pi \frac{Y}{X}$	$e^{-2\pi \frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.9994	-0.4368	0.9782	1.3132	0.2690	0.9737	-0.0140	0.9738	359.18
4.05	0.9981	-0.4285	0.9796	1.2918	0.2748	0.9734	-0.0138	0.9735	359.19
4.10	0.9969	-0.4206	0.9809	1.2712	0.2805	0.9732	-0.0137	0.9733	359.19
4.15	0.9956	-0.4129	0.9821	1.2513	0.2861	0.9730	-0.0135	0.9731	359.20
4.20	0.9943	-0.4055	0.9834	1.2320	0.2917	0.9728	-0.0134	0.9729	359.21
4.25	0.9931	-0.3984	0.9846	1.2134	0.2972	0.9726	-0.0133	0.9727	359.22
4.30	0.9918	-0.3915	0.9858	1.1954	0.3026	0.9724	-0.0131	0.9725	359.23
4.35	0.9905	-0.3849	0.9870	1.1779	0.3079	0.9722	-0.0130	0.9723	359.23
4.40	0.9891	-0.3785	0.9882	1.1611	0.3132	0.9720	-0.0129	0.9721	359.24
4.45	0.9878	-0.3723	0.9893	1.1447	0.3183	0.9719	-0.0127	0.9719	359.25
4.50	0.9865	-0.3663	0.9904	1.1288	0.3234	0.9717	-0.0126	0.9718	359.26
4.55	0.9852	-0.3605	0.9916	1.1135	0.3284	0.9715	-0.0125	0.9716	359.26
4.60	0.9838	-0.3549	0.9927	1.0985	0.3334	0.9714	-0.0124	0.9714	359.27
4.65	0.9825	-0.3494	0.9937	1.0841	0.3382	0.9712	-0.0123	0.9713	359.28
4.70	0.9812	-0.3442	0.9948	1.0700	0.3430	0.9710	-0.0122	0.9711	359.28
4.75	0.9798	-0.3390	0.9959	1.0563	0.3477	0.9709	-0.0120	0.9710	359.29
4.80	0.9785	-0.3341	0.9969	1.0430	0.3524	0.9707	-0.0119	0.9708	359.30
4.85	0.9771	-0.3292	0.9979	1.0301	0.3570	0.9706	-0.0118	0.9707	359.30
4.90	0.9758	-0.3246	0.9990	1.0175	0.3615	0.9704	-0.0117	0.9705	359.31
4.95	0.9745	-0.3200	1.0000	1.0052	0.3660	0.9703	-0.0116	0.9704	359.31
5.00	0.9731	-0.3156	1.0010	0.9933	0.3704	0.9702	-0.0115	0.9702	359.32
5.05	0.9718	-0.3113	1.0019	0.9816	0.3747	0.9700	-0.0114	0.9701	359.33
5.10	0.9705	-0.3071	1.0029	0.9703	0.3790	0.9699	-0.0113	0.9700	359.33
5.15	0.9692	-0.3030	1.0039	0.9592	0.3832	0.9698	-0.0112	0.9698	359.34
5.20	0.9679	-0.2990	1.0048	0.9484	0.3874	0.9697	-0.0111	0.9697	359.34
5.25	0.9666	-0.2951	1.0058	0.9379	0.3915	0.9695	-0.0111	0.9696	359.35
5.30	0.9653	-0.2913	1.0067	0.9276	0.3955	0.9694	-0.0110	0.9695	359.35
5.35	0.9640	-0.2877	1.0076	0.9175	0.3995	0.9693	-0.0109	0.9694	359.36
5.40	0.9627	-0.2841	1.0085	0.9076	0.4035	0.9692	-0.0108	0.9692	359.36
5.45	0.9614	-0.2805	1.0094	0.8980	0.4074	0.9691	-0.0107	0.9691	359.37
5.50	0.9602	-0.2771	1.0103	0.8886	0.4112	0.9689	-0.0106	0.9690	359.37
5.55	0.9589	-0.2738	1.0112	0.8794	0.4150	0.9688	-0.0105	0.9689	359.38
5.60	0.9577	-0.2705	1.0120	0.8704	0.4188	0.9687	-0.0105	0.9688	359.38
5.65	0.9564	-0.2673	1.0129	0.8615	0.4225	0.9686	-0.0104	0.9687	359.39
5.70	0.9552	-0.2642	1.0137	0.8529	0.4262	0.9685	-0.0103	0.9686	359.39
5.75	0.9540	-0.2611	1.0145	0.8444	0.4298	0.9684	-0.0102	0.9685	359.40
5.80	0.9528	-0.2581	1.0154	0.8361	0.4334	0.9683	-0.0101	0.9684	359.40
5.85	0.9516	-0.2552	1.0162	0.8280	0.4369	0.9682	-0.0101	0.9683	359.40
5.90	0.9504	-0.2524	1.0170	0.8200	0.4404	0.9681	-0.0100	0.9682	359.41
5.95	0.9493	-0.2496	1.0178	0.8122	0.4439	0.9680	-0.0099	0.9681	359.41
6.00	0.9481	-0.2468	1.0186	0.8045	0.4473	0.9679	-0.0099	0.9680	359.42
6.05	0.9470	-0.2441	1.0193	0.7969	0.4507	0.9678	-0.0098	0.9679	359.42
6.10	0.9458	-0.2415	1.0201	0.7895	0.4541	0.9677	-0.0097	0.9678	359.43
6.15	0.9447	-0.2389	1.0208	0.7823	0.4574	0.9676	-0.0096	0.9677	359.43
6.20	0.9436	-0.2364	1.0216	0.7751	0.4606	0.9676	-0.0096	0.9676	359.43
6.25	0.9425	-0.2339	1.0223	0.7681	0.4639	0.9675	-0.0095	0.9675	359.44
6.30	0.9414	-0.2315	1.0230	0.7613	0.4671	0.9674	-0.0094	0.9674	359.44
6.35	0.9404	-0.2291	1.0238	0.7545	0.4702	0.9673	-0.0094	0.9673	359.44
6.40	0.9393	-0.2268	1.0245	0.7479	0.4734	0.9672	-0.0093	0.9673	359.45
6.45	0.9383	-0.2245	1.0252	0.7414	0.4765	0.9671	-0.0092	0.9672	359.45
6.50	0.9372	-0.2223	1.0259	0.7349	0.4795	0.9671	-0.0092	0.9671	359.46
6.55	0.9362	-0.2201	1.0265	0.7286	0.4826	0.9670	-0.0091	0.9670	359.46
6.60	0.9352	-0.2179	1.0272	0.7224	0.4856	0.9669	-0.0091	0.9669	359.46
6.65	0.9342	-0.2158	1.0279	0.7163	0.4885	0.9668	-0.0090	0.9669	359.47
6.70	0.9332	-0.2137	1.0285	0.7104	0.4915	0.9667	-0.0089	0.9668	359.47
6.75	0.9322	-0.2117	1.0292	0.7045	0.4944	0.9667	-0.0089	0.9667	359.47
6.80	0.9312	-0.2097	1.0298	0.6987	0.4973	0.9666	-0.0088	0.9666	359.48
6.85	0.9303	-0.2077	1.0305	0.6930	0.5001	0.9665	-0.0088	0.9666	359.48
6.90	0.9293	-0.2058	1.0311	0.6873	0.5029	0.9665	-0.0087	0.9665	359.48
6.95	0.9284	-0.2039	1.0317	0.6818	0.5057	0.9664	-0.0087	0.9664	359.49

$k = -10.0$ $\sigma = 0.50$

a	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
4.00	0.0263	0.0140	0.0298	27.95	0.6564	0.2894	0.7174	23.79
4.05	0.0266	0.0138	0.0299	27.50	0.6610	0.2862	0.7203	23.41
4.10	0.0268	0.0137	0.0301	27.06	0.6655	0.2831	0.7232	23.05
4.15	0.0270	0.0135	0.0302	26.64	0.6697	0.2801	0.7260	22.70
4.20	0.0272	0.0134	0.0303	26.23	0.6739	0.2771	0.7287	22.36
4.25	0.0274	0.0133	0.0304	25.83	0.6779	0.2743	0.7313	22.03
4.30	0.0276	0.0131	0.0306	25.44	0.6818	0.2714	0.7339	21.71
4.35	0.0278	0.0130	0.0307	25.07	0.6857	0.2687	0.7364	21.40
4.40	0.0280	0.0129	0.0308	24.71	0.6894	0.2659	0.7389	21.10
4.45	0.0281	0.0127	0.0309	24.36	0.6930	0.2633	0.7413	20.80
4.50	0.0283	0.0126	0.0310	24.02	0.6965	0.2607	0.7437	20.52
4.55	0.0285	0.0125	0.0311	23.70	0.6999	0.2582	0.7460	20.25
4.60	0.0286	0.0124	0.0312	23.38	0.7032	0.2557	0.7482	19.98
4.65	0.0288	0.0123	0.0313	23.07	0.7064	0.2533	0.7505	19.72
4.70	0.0290	0.0122	0.0314	22.77	0.7096	0.2509	0.7527	19.47
4.75	0.0291	0.0120	0.0315	22.47	0.7127	0.2486	0.7548	19.23
4.80	0.0293	0.0119	0.0316	22.19	0.7157	0.2463	0.7569	18.99
4.85	0.0294	0.0118	0.0317	21.91	0.7187	0.2441	0.7590	18.76
4.90	0.0296	0.0117	0.0318	21.64	0.7216	0.2419	0.7611	18.53
4.95	0.0297	0.0116	0.0319	21.38	0.7244	0.2398	0.7631	18.31
5.00	0.0298	0.0115	0.0320	21.12	0.7272	0.2377	0.7651	18.10
5.05	0.0300	0.0114	0.0321	20.87	0.7299	0.2356	0.7670	17.89
5.10	0.0301	0.0113	0.0322	20.63	0.7326	0.2336	0.7689	17.69
5.15	0.0302	0.0112	0.0322	20.39	0.7352	0.2316	0.7708	17.49
5.20	0.0303	0.0111	0.0323	20.16	0.7377	0.2297	0.7727	17.29
5.25	0.0305	0.0111	0.0324	19.93	0.7403	0.2278	0.7745	17.10
5.30	0.0306	0.0110	0.0325	19.71	0.7427	0.2259	0.7763	16.92
5.35	0.0307	0.0109	0.0326	19.50	0.7451	0.2241	0.7781	16.74
5.40	0.0308	0.0108	0.0327	19.29	0.7475	0.2223	0.7798	16.56
5.45	0.0309	0.0107	0.0327	19.08	0.7498	0.2205	0.7816	16.39
5.50	0.0311	0.0106	0.0328	18.88	0.7521	0.2187	0.7833	16.22
5.55	0.0312	0.0105	0.0329	18.68	0.7544	0.2170	0.7850	16.05
5.60	0.0313	0.0105	0.0330	18.49	0.7566	0.2153	0.7866	15.89
5.65	0.0314	0.0104	0.0331	18.30	0.7587	0.2137	0.7882	15.73
5.70	0.0315	0.0103	0.0331	18.11	0.7609	0.2120	0.7899	15.57
5.75	0.0316	0.0102	0.0332	17.93	0.7630	0.2104	0.7914	15.42
5.80	0.0317	0.0101	0.0333	17.75	0.7650	0.2088	0.7930	15.27
5.85	0.0318	0.0101	0.0333	17.58	0.7670	0.2073	0.7946	15.12
5.90	0.0319	0.0100	0.0334	17.41	0.7690	0.2057	0.7961	14.98
5.95	0.0320	0.0099	0.0335	17.24	0.7710	0.2042	0.7976	14.84
6.00	0.0321	0.0099	0.0336	17.07	0.7729	0.2027	0.7991	14.70
6.05	0.0322	0.0098	0.0336	16.91	0.7748	0.2012	0.8005	14.56
6.10	0.0323	0.0097	0.0337	16.75	0.7767	0.1998	0.8020	14.43
6.15	0.0324	0.0096	0.0338	16.60	0.7785	0.1984	0.8034	14.29
6.20	0.0324	0.0096	0.0338	16.44	0.7803	0.1970	0.8048	14.17
6.25	0.0325	0.0095	0.0339	16.29	0.7821	0.1956	0.8062	14.04
6.30	0.0326	0.0094	0.0340	16.15	0.7838	0.1942	0.8075	13.91
6.35	0.0327	0.0094	0.0340	16.00	0.7856	0.1928	0.8089	13.79
6.40	0.0328	0.0093	0.0341	15.86	0.7873	0.1915	0.8102	13.67
6.45	0.0329	0.0092	0.0341	15.72	0.7889	0.1902	0.8115	13.55
6.50	0.0329	0.0092	0.0342	15.58	0.7906	0.1889	0.8128	13.44
6.55	0.0330	0.0091	0.0343	15.45	0.7922	0.1876	0.8141	13.32
6.60	0.0331	0.0091	0.0343	15.31	0.7938	0.1863	0.8154	13.21
6.65	0.0332	0.0090	0.0344	15.18	0.7953	0.1851	0.8166	13.10
6.70	0.0333	0.0089	0.0344	15.05	0.7969	0.1838	0.8178	12.99
6.75	0.0333	0.0089	0.0345	14.93	0.7984	0.1826	0.8190	12.88
6.80	0.0334	0.0088	0.0346	14.80	0.7999	0.1814	0.8202	12.78
6.85	0.0335	0.0088	0.0346	14.68	0.8014	0.1802	0.8214	12.68
6.90	0.0335	0.0087	0.0347	14.56	0.8028	0.1791	0.8226	12.57
6.95	0.0336	0.0087	0.0347	14.44	0.8043	0.1779	0.8237	12.47

$k = -10.0$ $\sigma = 0.50$									
a	$\frac{1-\sigma^2}{2}\cdot x$		$\frac{1}{X}$	$2\pi\frac{Y}{X}$	$e^{-2\pi\frac{Y}{X}}$	$-\eta$			
	REAL	IMAG.				REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.9275	-0.2020	1.0323	0.6764	0.5085	0.9663	-0.0086	0.9664	359.49
7.05	0.9266	-0.2002	1.0329	0.6710	0.5112	0.9662	-0.0085	0.9663	359.49
7.10	0.9257	-0.1984	1.0335	0.6658	0.5139	0.9662	-0.0085	0.9662	359.50
7.15	0.9248	-0.1966	1.0341	0.6606	0.5166	0.9661	-0.0084	0.9661	359.50
7.20	0.9239	-0.1949	1.0347	0.6555	0.5192	0.9660	-0.0084	0.9661	359.50
7.25	0.9230	-0.1932	1.0353	0.6504	0.5218	0.9660	-0.0083	0.9660	359.51
7.30	0.9222	-0.1915	1.0358	0.6455	0.5244	0.9659	-0.0083	0.9660	359.51
7.35	0.9213	-0.1898	1.0364	0.6406	0.5270	0.9659	-0.0082	0.9659	359.51
7.40	0.9205	-0.1882	1.0370	0.6358	0.5295	0.9658	-0.0082	0.9658	359.51
7.45	0.9196	-0.1866	1.0375	0.6311	0.5320	0.9657	-0.0081	0.9658	359.52
7.50	0.9188	-0.1850	1.0380	0.6264	0.5345	0.9657	-0.0081	0.9657	359.52
7.55	0.9180	-0.1835	1.0386	0.6218	0.5370	0.9656	-0.0080	0.9656	359.52
7.60	0.9172	-0.1820	1.0391	0.6173	0.5394	0.9656	-0.0080	0.9656	359.53
7.65	0.9164	-0.1805	1.0396	0.6128	0.5418	0.9655	-0.0079	0.9655	359.53
7.70	0.9156	-0.1790	1.0402	0.6084	0.5442	0.9654	-0.0079	0.9655	359.53
7.75	0.9148	-0.1775	1.0407	0.6040	0.5466	0.9654	-0.0079	0.9654	359.53
7.80	0.9141	-0.1761	1.0412	0.5998	0.5489	0.9653	-0.0078	0.9654	359.54
7.85	0.9133	-0.1747	1.0417	0.5955	0.5513	0.9653	-0.0078	0.9653	359.54
7.90	0.9125	-0.1733	1.0422	0.5914	0.5536	0.9652	-0.0077	0.9652	359.54
7.95	0.9118	-0.1720	1.0427	0.5873	0.5558	0.9652	-0.0077	0.9652	359.54
8.00	0.9111	-0.1706	1.0431	0.5832	0.5581	0.9651	-0.0076	0.9651	359.55
8.05	0.9103	-0.1693	1.0436	0.5792	0.5603	0.9651	-0.0076	0.9651	359.55
8.10	0.9096	-0.1680	1.0441	0.5753	0.5625	0.9650	-0.0075	0.9650	359.55
8.15	0.9089	-0.1667	1.0446	0.5714	0.5647	0.9650	-0.0075	0.9650	359.55
8.20	0.9082	-0.1654	1.0450	0.5676	0.5669	0.9649	-0.0075	0.9649	359.56
8.25	0.9075	-0.1642	1.0455	0.5638	0.5690	0.9649	-0.0074	0.9649	359.56
8.30	0.9068	-0.1630	1.0460	0.5601	0.5712	0.9648	-0.0074	0.9648	359.56
8.35	0.9061	-0.1617	1.0464	0.5564	0.5733	0.9648	-0.0073	0.9648	359.56
8.40	0.9054	-0.1606	1.0468	0.5528	0.5754	0.9647	-0.0073	0.9647	359.57
8.45	0.9048	-0.1594	1.0473	0.5492	0.5774	0.9647	-0.0073	0.9647	359.57
8.50	0.9041	-0.1582	1.0477	0.5456	0.5795	0.9646	-0.0072	0.9646	359.57
8.55	0.9035	-0.1571	1.0482	0.5421	0.5815	0.9646	-0.0072	0.9646	359.57
8.60	0.9028	-0.1560	1.0486	0.5387	0.5835	0.9645	-0.0071	0.9645	359.58
8.65	0.9022	-0.1548	1.0490	0.5353	0.5855	0.9645	-0.0071	0.9645	359.58
8.70	0.9015	-0.1537	1.0494	0.5319	0.5875	0.9644	-0.0071	0.9645	359.58
8.75	0.9009	-0.1527	1.0498	0.5286	0.5894	0.9644	-0.0070	0.9644	359.58
8.80	0.9003	-0.1516	1.0502	0.5253	0.5914	0.9643	-0.0070	0.9644	359.58
8.85	0.8997	-0.1505	1.0506	0.5221	0.5933	0.9643	-0.0070	0.9643	359.59
8.90	0.8991	-0.1495	1.0510	0.5189	0.5952	0.9643	-0.0069	0.9643	359.59
8.95	0.8984	-0.1485	1.0514	0.5157	0.5971	0.9642	-0.0069	0.9642	359.59
9.00	0.8978	-0.1475	1.0518	0.5126	0.5989	0.9642	-0.0068	0.9642	359.59
9.05	0.8973	-0.1465	1.0522	0.5095	0.6008	0.9641	-0.0068	0.9642	359.60
9.10	0.8967	-0.1455	1.0526	0.5065	0.6026	0.9641	-0.0068	0.9641	359.60
9.15	0.8961	-0.1445	1.0530	0.5034	0.6044	0.9641	-0.0067	0.9641	359.60
9.20	0.8955	-0.1436	1.0534	0.5005	0.6062	0.9640	-0.0067	0.9640	359.60
9.25	0.8949	-0.1426	1.0537	0.4975	0.6080	0.9640	-0.0067	0.9640	359.60
9.30	0.8944	-0.1417	1.0541	0.4946	0.6098	0.9639	-0.0066	0.9640	359.61
9.35	0.8938	-0.1408	1.0545	0.4917	0.6116	0.9639	-0.0066	0.9639	359.61
9.40	0.8933	-0.1399	1.0548	0.4889	0.6133	0.9639	-0.0066	0.9639	359.61
9.45	0.8927	-0.1390	1.0552	0.4861	0.6150	0.9638	-0.0065	0.9638	359.61
9.50	0.8922	-0.1381	1.0556	0.4833	0.6167	0.9638	-0.0065	0.9638	359.61
9.55	0.8916	-0.1372	1.0559	0.4806	0.6184	0.9637	-0.0065	0.9638	359.61
9.60	0.8911	-0.1363	1.0563	0.4779	0.6201	0.9637	-0.0065	0.9637	359.62
9.65	0.8906	-0.1355	1.0566	0.4752	0.6218	0.9637	-0.0064	0.9637	359.62
9.70	0.8901	-0.1346	1.0570	0.4725	0.6234	0.9636	-0.0064	0.9637	359.62
9.75	0.8895	-0.1338	1.0573	0.4699	0.6251	0.9636	-0.0064	0.9636	359.62
9.80	0.8890	-0.1330	1.0576	0.4673	0.6267	0.9636	-0.0063	0.9636	359.62
9.85	0.8885	-0.1322	1.0580	0.4647	0.6283	0.9635	-0.0063	0.9636	359.63
9.90	0.8880	-0.1314	1.0583	0.4622	0.6299	0.9635	-0.0063	0.9635	359.63
9.95	0.8875	-0.1306	1.0586	0.4597	0.6315	0.9635	-0.0062	0.9635	359.63
10.00	0.8870	-0.1298	1.0590	0.4572	0.6330	0.9634	-0.0062	0.9635	359.63

k = -10.0					σ = 0.50			
$\dot{a}$	$1+\eta$				$1+\eta F_{10}$			
	REAL	IMAG.	MODULUS	PHASE (DEGREES)	REAL	IMAG.	MODULUS	PHASE (DEGREES)
7.00	0.0337	0.0086	0.0348	14.33	0.8057	0.1768	0.8249	12.37
7.05	0.0338	0.0085	0.0348	14.21	0.8071	0.1756	0.8260	12.28
7.10	0.0338	0.0085	0.0349	14.10	0.8085	0.1745	0.8271	12.18
7.15	0.0339	0.0084	0.0349	13.99	0.8098	0.1734	0.8282	12.09
7.20	0.0340	0.0084	0.0350	13.88	0.8112	0.1723	0.8293	11.99
7.25	0.0340	0.0083	0.0350	13.77	0.8125	0.1713	0.8303	11.90
7.30	0.0341	0.0083	0.0351	13.66	0.8138	0.1702	0.8314	11.81
7.35	0.0341	0.0082	0.0351	13.56	0.8151	0.1691	0.8324	11.72
7.40	0.0342	0.0082	0.0352	13.46	0.8163	0.1681	0.8334	11.64
7.45	0.0343	0.0081	0.0352	13.36	0.8176	0.1671	0.8345	11.55
7.50	0.0343	0.0081	0.0353	13.26	0.8188	0.1661	0.8355	11.47
7.55	0.0344	0.0080	0.0353	13.16	0.8200	0.1651	0.8364	11.38
7.60	0.0344	0.0080	0.0354	13.06	0.8212	0.1641	0.8374	11.30
7.65	0.0345	0.0079	0.0354	12.96	0.8224	0.1631	0.8384	11.22
7.70	0.0346	0.0079	0.0355	12.87	0.8235	0.1621	0.8393	11.14
7.75	0.0346	0.0079	0.0355	12.78	0.8247	0.1612	0.8403	11.06
7.80	0.0347	0.0078	0.0355	12.69	0.8258	0.1602	0.8412	10.98
7.85	0.0347	0.0078	0.0356	12.60	0.8269	0.1593	0.8421	10.90
7.90	0.0348	0.0077	0.0356	12.51	0.8280	0.1584	0.8431	10.83
7.95	0.0348	0.0077	0.0357	12.42	0.8291	0.1575	0.8440	10.75
8.00	0.0349	0.0076	0.0357	12.33	0.8302	0.1566	0.8449	10.68
8.05	0.0349	0.0076	0.0358	12.25	0.8313	0.1557	0.8457	10.61
8.10	0.0350	0.0075	0.0358	12.16	0.8323	0.1548	0.8466	10.54
8.15	0.0350	0.0075	0.0358	12.08	0.8334	0.1539	0.8475	10.46
8.20	0.0351	0.0075	0.0359	12.00	0.8344	0.1531	0.8483	10.39
8.25	0.0351	0.0074	0.0359	11.92	0.8354	0.1522	0.8492	10.33
8.30	0.0352	0.0074	0.0360	11.84	0.8364	0.1514	0.8500	10.26
8.35	0.0352	0.0073	0.0360	11.76	0.8374	0.1505	0.8508	10.19
8.40	0.0353	0.0073	0.0360	11.68	0.8384	0.1497	0.8516	10.12
8.45	0.0353	0.0073	0.0361	11.60	0.8393	0.1489	0.8524	10.06
8.50	0.0354	0.0072	0.0361	11.53	0.8403	0.1481	0.8532	9.99
8.55	0.0354	0.0072	0.0362	11.45	0.8412	0.1473	0.8540	9.93
8.60	0.0355	0.0071	0.0362	11.38	0.8422	0.1465	0.8548	9.87
8.65	0.0355	0.0071	0.0362	11.31	0.8431	0.1457	0.8556	9.81
8.70	0.0356	0.0071	0.0363	11.24	0.8440	0.1449	0.8563	9.74
8.75	0.0356	0.0070	0.0363	11.17	0.8449	0.1442	0.8571	9.68
8.80	0.0357	0.0070	0.0363	11.10	0.8458	0.1434	0.8578	9.62
8.85	0.0357	0.0070	0.0364	11.03	0.8466	0.1427	0.8586	9.56
8.90	0.0357	0.0069	0.0364	10.96	0.8475	0.1419	0.8593	9.51
8.95	0.0358	0.0069	0.0364	10.89	0.8484	0.1412	0.8600	9.45
9.00	0.0358	0.0068	0.0365	10.82	0.8492	0.1405	0.8607	9.39
9.05	0.0359	0.0068	0.0365	10.76	0.8500	0.1397	0.8615	9.33
9.10	0.0359	0.0068	0.0365	10.69	0.8509	0.1390	0.8622	9.28
9.15	0.0359	0.0067	0.0366	10.63	0.8517	0.1383	0.8629	9.22
9.20	0.0360	0.0067	0.0366	10.56	0.8525	0.1376	0.8635	9.17
9.25	0.0360	0.0067	0.0366	10.50	0.8533	0.1369	0.8642	9.12
9.30	0.0361	0.0066	0.0367	10.44	0.8541	0.1362	0.8649	9.06
9.35	0.0361	0.0066	0.0367	10.38	0.8549	0.1356	0.8656	9.01
9.40	0.0361	0.0066	0.0367	10.32	0.8557	0.1349	0.8662	8.96
9.45	0.0362	0.0065	0.0368	10.26	0.8564	0.1342	0.8669	8.91
9.50	0.0362	0.0065	0.0368	10.20	0.8572	0.1336	0.8675	8.86
9.55	0.0363	0.0065	0.0368	10.14	0.8579	0.1329	0.8682	8.81
9.60	0.0363	0.0065	0.0369	10.08	0.8587	0.1323	0.8688	8.76
9.65	0.0363	0.0064	0.0369	10.03	0.8594	0.1316	0.8694	8.71
9.70	0.0364	0.0064	0.0369	9.97	0.8602	0.1310	0.8701	8.66
9.75	0.0364	0.0064	0.0369	9.91	0.8609	0.1304	0.8707	8.61
9.80	0.0364	0.0063	0.0370	9.86	0.8616	0.1298	0.8713	8.56
9.85	0.0365	0.0063	0.0370	9.80	0.8623	0.1291	0.8719	8.52
9.90	0.0365	0.0063	0.0370	9.75	0.8630	0.1285	0.8725	8.47
9.95	0.0365	0.0062	0.0371	9.70	0.8637	0.1279	0.8731	8.43
10.00	0.0366	0.0062	0.0371	9.64	0.8644	0.1273	0.8737	8.38

DEPARTMENT OF THE AIR FORCE
AIR FORCE RESEARCH LABORATORY
WRIGHT-PATTERSON AIR FORCE BASE OHIO 45433-7008

3 August 2015

MEMORANDUM FOR DTIC-O
8725 JOHN J. KINGMAN ROAD
FORT BELVOIR, VA 22060-6218

FROM: 711 HPW/OMCA (STINFO)
2947 Fifth Street
Wright-Patterson AFB, OH 45433-7913

SUBJECT: Request to Change the Distribution Statement on a Technical Report

This memo documents the requirement for DTIC to change the distribution statement on the following technical report from distribution statement F to A, Approved for Public Release; distribution is unlimited.

AD Number: ADB295267
Publication number: Technical Report 56-614
Title: An Elastic Tube Theory of Oscillatory Flow in Mammalian Arteries

Reason for request: The current Distribution F limits release of the data, methods, and conclusions of this study to Further Dissemination Only As Directed. After thoroughly reviewing this document, a Subject Matter Expert from the 711 HPW found no information that would require this information to have any type of restrictive distribution. It was not uncommon for most research reports during this period of time to be restricted to protect the research knowledge base. My recommendation is to have this document status changed to (Distribution A, Approved for public release: distribution unlimited.

Donald Denio

DONALD DENIO
STINFO Officer
711th Human Performance Wing